

**THE
MEDICAL GUIDE
FOR INDIA**

THE
MEDICAL GUIDE
FOR INDIA
AND INDEX OF TREATMENT

BY

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PREFACE

The object of this book is to give all classes of Practitioners in India a brief compact reference to the extremely varied questions arising in the course of their daily work.

The fact that the book has been through four editions and two reprints with a steady demand maintained for over fourteen years shows that this object is being fulfilled.

In this edition all the more important sections have been entirely re-written and articles by specialists increased in number. The Index of Treatment has been remodelled on lines to give a quicker form of reference and carefully brought up to date.

It was necessary to completely rewrite Section XI Pharmacology in accordance with the new edition of the British Pharmacopœia, 1932.

As in the last edition a number of references to the latest and more important literature have been included, enabling the reader to obtain further information on any particular subject.

The following is a list of Authors and Helpers to whom I am much indebted for their valuable assistance :—

Lord Moynihan, K.C.M.G., C.B., late President, Royal College of Surgeons.

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Dr. E. Shriklande, B.Sc., M.B., B.S., Acting Supt., Sanatorium, Bhowali.

I have also to thank Messrs. Down and Bros. for their ready help and loan of blocks, and the Librarian of the Royal Society of Medicine for his great assistance in compiling the numerous references. The Editors of the Practitioner, the Clinical Journal and the Guy's Hospital Gazette for their courtesy in allowing the reprints of the articles from their publications.

In conclusion I have to thank the Publishers and more especially Mr. Holme, Miss Clark and the Calcutta Office for their valuable help and constant co-operation.

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E. J. O'MEARA.

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GENERAL PLAN OF TREATMENT

1. Make a very careful and detailed examination of the patient, omitting no method of examination that could possibly help you in coming to a diagnosis.

2. Having made a diagnosis, carefully weigh all the points of the case and decide on a definite plan of treatment—this is essential.

3. Having decided on a plan, stick to it, and do not be turned from your objective by the wishes of the patient or relatives. At the same time, should the subsequent course of the case and symptoms demand a change, do not be afraid to admit it, and to act accordingly.

4. If the patient and his friends decline your plan—for example, of operation in the case of an urgent appendicitis—do not be persuaded to adopt palliative treatment, but courteously decline to attend the case. Many Indian practitioners too often fail to take up this attitude, fearing the loss of a patient. But if your diagnosis is correct, the subsequent course of the case will not only vindicate your opinion, but considerably increase your prestige as a practitioner.

5. In making your plan, consider the mental and physical peculiarities of the patient, and his social position. Do not recommend a treatment that is beyond his powers or means to carry out.

6. Let the plan be as simple as possible, and do not write long scatter-gun prescriptions.

7. Avoid new remedies, until time and science have tested as to their value, and above all, do not dose your patients with much advertised samples. On the other hand, do not be ultra-conservative, but when new methods have proved to the profession their undoubted value, use them. Knowledge without action is useless.

8. Do not be fussy or faddy, and this especially applies to diet; if a strict diet is all-important, as in diabetes, enforce it, but otherwise do not be too rigid; little relaxations make a vast difference to a weary sick patient with his nerves all on edge.

9. Finally, realize the limitations of treatment, and when a cure is impossible, do not be cruel by stimulating the failing powers with strychnine and oxygen, but make the passing easy

MISTAKES

In the profession of medicine, as in all walks of life, you will make mistakes, in every subject—diagnosis, prognosis and treatment,—no matter how clever and careful you are, and the object of this article is to reduce those mistakes to a minimum.

Mistakes may be of omission or commission, involving the doctor's reputation or conscience, trivial or serious to the degree of loss of the patient's life.

Mistakes may be divided into the following classes:—

1. THOSE CAUSED BY CARELESSNESS.—Examples of this class are: Omitting to pass the finger into the rectum in the case of a patient over 45 complaining of diarrhoea, cases of carcinoma in the operable stage being thus overlooked. Mistaking the pregnant uterus for an ovarian cyst by omitting to auscultate for the foetal heart. Omitting to take the temperature of a patient who complains of being "out of sorts," thereby overlooking a case of typhoid. Omitting to ask a patient complaining of sciatica if the pain is in both legs and worse at night; if this is the case, an examination of the abdomen and rectum should be made for growth. Mistaking the brim of the pelvis, or the psoas and iliacus muscles, for an enlarged Fallopian tube.

2. THOSE CAUSED BY SHEER IGNORANCE.—Examples of this class are: Neglect to pass a catheter in doubtful abdominal tumours, and in failure to recognize retention of urine, especially in primipara after delivery. Diagnosing conjunctivitis in a case of iritis by omitting to notice if the iris reacts to light. Diagnosing rheumatism in a child complaining of pain in the knee joint when the lower end of the femur is enlarged by sarcoma.

3. THOSE CAUSED BY IMPATIENCE.—These are frequently caused by the Fallacy of Obsession: the practitioner's mind is filled with the idea of one particular disease, and he sees it in many of his cases, to the exclusion of everything else.

I was once called in to open the abdomen of a man who had received a severe kick from a horse. So certain were the doctors in charge of the case, that the man had ruptured intestine, that when I arrived, he was already on the table and the instruments prepared. Declining to operate without examining the case, a large patch of traumatic pneumonia was found, from which the patient rapidly recovered.

Above all, do not be impatient in making a diagnosis in acute conditions. I have known reputations lost by mistaking meningitis for pneumonia and making a positive diagnosis of small-pox on insufficient data.

4. THOSE CAUSED BY BEING MISLED BY THE PATIENT.—Either through the fallacy of suggestion on the part of the doctor, or by ignorance or malingering on the part of the patient.

5. UNAVOIDABLE MISTAKES.—These are mostly connected with the abdominal conditions, and are made by the most eminent surgeons and physicians. I have seen the abdomen opened for an ovarian cyst, which proved to be a floating spleen, and an operation for appendicitis, which proved to be elongated gall bladder anchored in the iliac fossa.

6. MISTAKES IN PROGNOSIS.—Do not be anxious to give a prognosis: there are very few diseases in which the prognosis is a certainty, and a mistake, while perhaps not serious for the patient, may seriously damage your reputation.

Take, for example, typhoid: there are three important complications which may occur even in apparent convalescence—cardiac failure, hæmorrhage and perforation—and completely upset any prognosis.

Again, in cardiac disease, nephritis and pulmonary conditions, more especially tubercle, a definite prognosis is impossible.

Above all, when the case will obviously terminate fatally, do not commit yourself to an opinion as to the time of death, as this is a question on which no one can give an opinion with any degree of certainty.

ABORTION

There are two clinical forms (1) Threatened and (2) Inevitable.

THREATENED ABORTION.—May be defined as the stage in which the symptoms of pain and bleeding are not accompanied by any or only slight dilatation of the cervical canal.

TREATMENT.—Keep the patient at absolute rest in bed, avoid strong purgatives and enemas, but if there is constipation open the bowels with drachm doses of Castor Oil in coffee repeated every four hours. Give \mathcal{R} Tr. Opii. \mathfrak{m} 30 t.d.s. for three or four days. Keep in bed for a week after all symptoms have subsided.

INEVITABLE ABORTION.—Abortion is inevitable when:—

1. The ovum is in the cervical canal.
2. The patient having been in bed, dribbling of blood has continued for six weeks.
3. Incomplete abortion is diagnosed.

4. Missed abortion is diagnosed.
5. There is marked anæmia from loss of blood, rigors or pyrexia.

TREATMENT.—Under these circumstances empty the uterus with the strictest aseptic precautions, the best plan by far is with the gloved finger, but if the os will not admit a finger, try Rheinstadter's curette; if this is too large, either plug the vagina or dilate the cervix with Hegar's dilators so as to admit one finger.

If the entire ovum has already been expelled, treat the patient as for a full term delivery.

ABSCESS

All abscesses must be freely opened as soon as evident, with due regard to the anatomy of the part, and free drainage given. If important structures are endangered, use Hilton's method, i.e. cut down to the deep fascia, insert a director into the swelling until pus flows along the grove, and then enlarge the opening with sinus or Spencer Well's forceps. Drain by gauze wick or tube. It is important that the abscess cavity should not be curetted, flushed out with strong antiseptics or squeezed. Rest is essential in the after-treatment.

SPECIAL ABSCESSSES

ANAL.—As for Ischio-rectal abscess.

AXILLARY.—Make a vertical incision on the inner wall, and reach the pus by Hilton's method.

CEREBRAL.—Delay is dangerous especially in cerebellar abscess from respiratory failure. Operative treatment is urgently called for in all cases.

ISCHIO-RECTAL.—An acute inflammatory mass should be incised immediately before pus is evident. This shortens convalescence and may prevent the formation of a fistula. Under anæsthesia, a curved incision is made parallel to the anal margin, over the apex of the swelling and extending well beyond it both in front and behind. A second incision is made outwards at right angles well beyond the induration. A finger is introduced and breaks down all septa, the cutaneous angles are cut away to give the freest drainage.

In 50% of cases an opening has or will develop into the bowel, but then the case must be treated as for fistula. In the tubercular variety the abscess wall should be scraped, and active anti-tubercular treatment employed.

MAMMARY.—This may be one of three types—(a) Sub-areolar. (b) Parenchymatous or deep. (c) Retromammary. (a) and (b) are opened immediately by a free incision radiating from the nipple to avoid cutting the ducts. Introduce a finger and break down all septa freely to give good drainage, this is essential. A drainage tube is introduced and a careful outlook kept for fresh burrowing of pus. In many cases it is better to drain the abscess by a secondary incision in the infra-mammary sulcus at the outer margin of the breast, stitching up the original incision. Lactation must be stopped.

Retro-mammary abscess is opened in the sulcus beneath the breast at its outer margin, and search made for any bare bone or communication with the thoracic cavity.

PALMAR AND PLANTAR.—Should be opened by incisions which carefully avoid the arterial arches, as hæmorrhage from them is frequently troublesome and serious. If pus has tracked back, make counter-incisions on the dorsum. Complete rest must be given by a splint. An important sequela is adhesions in the tendon sheaths, and this must be dealt with by careful movements of the fingers as soon as the wound is healthy, and temperature normal.

PERITONSILLAR OR QUINSY.—Spray or swab on 10% Cocaine. On no account give a general anæsthetic, the risk of pus running down into the larynx is too great. An incision is made from without inwards, in a line from the last molar to the base of the uvula, and towards the inner rather than the outer end of the line. The cut is made through the anterior pillar of the fauces behind which the pus lies, and not through the tonsil which would cause considerable pain. There is usually considerable difficulty in getting the patient's mouth open. On account of the great discomfort to the patient the operation should be performed as rapidly as possible.

SUBMAXILLARY.—The incision should either be vertical in the middle line or parallel with and under the border of the lower jaw. Local anæsthesia only must be used, if there is any dyspnœa. Cellulitis in this region is dangerous from œdema of the glottis, and incision gives great relief.

HEPATIC.—Treatment with Emetine Hydrochloride will cause even large abscesses to resolve, helped by aspiration, and repeated if necessary. Operation is only required when these measures fail, there is the alternative of the abdominal and thoracic routes, but as most abscesses are situated on the upper and posterior part of the liver the thoracic is the better. When the pus has been evacuated the cavity is irrigated with a solution of Emetine 4 or 5 grs., the cavity closed and drained only down to the site of closure.

PULMONARY.—The treatment of the acute abscess is chiefly medical, but subacute and chronic abscess unless improving should be treated surgically, otherwise the result will be a spreading bronchiectasis.

RETROPHARYNGEAL.—This may be either septic or tubercular from spinal caries. It is most common in children from two months to two years. It should be opened with a guarded bistoury, the child's head hanging over the end of the table.

ACHOLURIC JAUNDICE

The best treatment is splenectomy, failing this the case should be treated as if for gall-stones.

ACIDOSIS

An acid intoxication due to continued and obstinate vomiting, such as delayed anæsthetic poisoning, pernicious vomiting of pregnancy, cyclical vomiting of children, the poison of diabetes, severe fever, salicylates and in starvation.

TREATMENT.—Give Sod. Bicarb. by the mouth, rectum or in urgent cases intravenously. By mouth one drachm doses every three hours in water sweetened with Glucose. Per rectum a pint with 10% Sod. Bicarb. and 10% Glucose. Intravenous 5% Sod. Bicarb. and 2½% Glucose.

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ACNE ROSACEA AND VULGARIS

The face should be well washed with warm water and soap before applying the following:—

R Sulph. Præcip.	• gr. 10	or R Sulph. Præcip.	3i
Resorein	gr. 10	Calamine	5ij
Zinc Oxide	5ij	Zinc Oxide	5ij
Tannin	5ij	Glycerine	3i
Pulv. Amyl.	5ij	Aqua Dest.	3vi
Paraffin Mollis Flav.	5ij	Shake well and paint on with a brush (<i>R. I. Edin.</i>)..	

X-RAYS.—Two or three doses of half a Sabouraud pastille at fortnightly intervals are effective. Vaccines are not uniformly successful in acne. Internally the digestion should be attended to. Acid Hydrochlor. Dil. 3j in a tumbler of water t.d.s.p.c. Alcohol, tea, coffee, spices and curry are excluded from the diet.

ACROMEGALY

In many cases the arrest of the disease is spontaneous. If progressive with intense headache and loss of vision, consider operative treatment. Pituitary extract and thyroid preparations may be tried.

ACTINOMYCOSIS

The most successful treatment locally is excision, failing this incision and gentle scraping, dressing with Hydrogen Peroxide. Internally very large doses of Potassium Iodide 150 to 200 grs. daily. Some cases have benefited from a vaccine and injection of Iodipin 1%.

ACUTE YELLOW ATROPHY OF THE LIVER

Cases of Jaundice in which this complication is feared, should be given fluids freely with glucose and alkalies, to eliminate toxins. The bowels opened with mercury and salines, and the urine increased with diuretics such as Diuretin.

ADDISON'S ANÆMIA—See Anæmia, Pernicious.

ADDISON'S DISEASE

The most hopeful treatment is Cortical Hormone given preferably intravenously, especially in a crisis. It is more efficient than Muirhead's regimen of Adrenalin by mouth, rectum, and hypodermically. The patient must give up all active work. Vomiting is treated with iced champagne, bismuth and oxalate of cerium. See also article *Recent Advances in Medicine*.

ADENOIDS

This hypertrophy of the normal lymphoid tissue of the post-nasal space must be removed by operation, as if allowed to

remain, the nose may become permanently deformed with deafness which will probably be progressive. The risk of acute otitis media and mastoid trouble in any of the acute exanthemata is much greater. The child is certain to suffer from indifferent health until the operation is done. The operation is performed either with a curette or with Lowenberg's forceps, under ether by the open method, 1/100 gr. of Atropine being given previously. In the after-treatment the use of breathing exercises is most important.

AIR PASSAGES AND ŒSOPHAGUS—FOREIGN BODIES IN

Pain after swallowing a foreign body frequently only means an abrasion of the mucus membrane, but the finding of a wound does not necessarily negative the presence of an impacted body elsewhere. If the wound is so severe as to explain the symptoms, then it should be treated by the sipping of Hydrogen Peroxide 3 vol. strength in teaspoonful doses hourly.

It is well known that the ability of a patient to localize the position of a wound or foreign body in the throat is very imperfect, and affords no reliable guide. The tonsil is the most frequent seat of impaction of small sharp bodies such as pins or fish bones, here palpation is delusive and careful examination with good illumination is essential, which also enables the body to be seized with certainty and precision at the outset. As regards the nature and seat of impaction of the body reliance should be placed on:—(1) The history. (2) Ocular or Digital examination. (3) Radioscopic findings.

The treatment of foreign bodies has been revolutionized by the direct inspection of the air passages from the larynx to the division of the smaller bronchi and of the œsophagus by instruments such as Bruning's or Chevalier Jackson's, a method requiring care, delicate touch and patience. For diagnostic purposes examination of the œsophagus requires greater caution than that of the trachea. Mortality from the removal of foreign bodies by Œsophagotomy is very much greater than that following the endoscopic method. In an emergency, the quickest, easiest and safest route into the windpipe is through the cricothyroid membrane.

ALBUMINURIA

Functional and Cyclical. The albumin is present when the patient is up and moving about, but disappears with rest in bed. It is often associated with weakness of the muscular system, and requires general tonic treatment with exercise, baths and mas-

sage; rather than drugs aimed at the control of the albuminuria. Cyclical albuminuria is due to nervous instability, and should be treated by exercise in the open air, wholesome diet and avoidance of emotional excitement and overwork.

ALCOHOLISM

This may be divided into Acute conditions: (1) Acute Alcoholic Poisoning and (2) Delirium Tremens. Chronic conditions: (1) Dipsomania, (2) Chronic Alcoholism and (3) Korsakow's Psychosis.

ACUTE ALCOHOLIC POISONING.—If the patient is in a condition of coma, do not give emetics, but wash out the stomach and leave in half a pint of coffee. Keep the patient warm and let him sleep it off. If collapsed, give a hypodermic of Strychnine.

DELIRIUM TREMENS.—This follows in two or three days after the withdrawal of alcohol, on account of accident or illness in a patient who has acquired a high degree of tolerance by long use. Once developed it should be treated by a hot bath and a good dose of Calomel 5 grs. Good nursing in a quiet room, the attendants being warned of the risk of suicide. Sleep must be induced by hypnotics such as a combination of Bromide, Chloral and Hyoscyamus or Veronal grs. 10 repeated every two hours for several doses. If there is great excitement, Hyoscyne Hydrobromide 1/100 gr. to 1/50 gr. with or without Morphia gr. $\frac{1}{8}$. Diuretics and stimulants should be given such as:—

R Tr. <i>Strophanthus</i>	m 4	R Tr. <i>Digitalis</i>	m 7
Tr. <i>Nux Vom.</i>	m 12	Tr. <i>Nux Vom.</i>	m 10
Tr. <i>Belladonna</i>	m 10	Calomel	gr. 8
Diuretin	gr. 8	Sod. Sal.	gr. 5
Aqua Camph. ad.	℥j	Inf. Auranti Co. ad.	℥j
t.d.s.		4 hours.	

Plenty of water should be given to drink, and a light diet of milk and eggs.

DIPSOMANIA.—Is a recurrent craving for alcoholic excess. It is characteristic of the disease that between the paroxysms the patient has no desire and even an aversion to alcohol. It is a congenital idiosyncrasy, and not the result of continual drinking. There is no means of preventing the periodic craving, but the premonitory stage marked by restlessness, irritability and insomnia should be treated with doses of Apomorphine 1/30 gr. hypodermically every three or four hours. If the attack is already established, give hypodermically Apomorphine 1/10 gr. This precipitates the gastric crisis causing acute vomiting, the patient falls into a deep sleep and awakes free from the craving.

CHRONIC ALCOHOLISM.—For treatment the patient should be placed in a special institution under skilled supervision, and the special treatment with Atropine and Strychnine advocated by McBride carried out. This consists in working the doses of these drugs up to a maximum over a period of three weeks, and then a gradual reduction for another three weeks. If this is impossible the following mixtures may be tried:—

R Liq. Ext. Cinchonæ	12 m	R Tr. Capsici	12 m
Tr. Gentian Co.	45 m	Spt. Añm. Aromat.	30 m
Tr. Rhei Co.	15 m	Tr. Cinchonæ	30 m
Tr. Capsicum	12 m	Tr. Card. Co.	25 m
Sol. of Atropine Sulph.		Aquam ad.	3ss
(1 gr. to 3j)	2 m		
Sol. of Strychnine Nit.			
(4 gr. to 3j)	2 m		
Glycerine	3ss		
Aqua Chloroformi ad.	3i		
In a wineglass of water			
3 times daily.			

Dr. Paton of Melbourne regards Emetine Hydrochloride $\frac{1}{4}$ gr. dose every second day as a specific, and it has certainly been effective in some cases. In all cases withdrawal of alcohol should be gradual otherwise troublesome insomnia, delirium tremens or alcoholic epilepsy may be induced.

KORSAKOW'S PSYCHOSIS.—Is an alcoholic insanity with disorientation, loss of memory and often associated with polynouritis. It should be treated with Strychnine and Atropine followed by massage and electrical treatment.

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ALLERGIC STATE

The following are Allergic conditions:—

Urticaria.	Dermatitis from external irritants.
Eczema.	Gout.
Arterio-sclerosis.	Asthma.
Circumscribed Prurigo.	

Migraine.	Chronic Nephritis.
Neuralgia.	Grave's Disease.
Gastro-intestinal Dyspepsia.	Rheumatoid Arthritis.
General Pruritus.	Spasmodic Rhinorrhœa;

and at times Psychological Crises chiefly Melancholia with suicidal tendencies.

How are we to explain the pathogenesis of these non-specific reactions of multiple causation? Why is it that a Streptococcus or other infection, an article of food, a drug, or a foreign serum can all produce eruptions as distinctive as Urticaria or Erythema Multiforme?

Animal experiments and the study of serum sickness have taught us, that one and the same antigen can produce different symptoms in different individuals, and it is thus clear that in the pathogenesis of non-specific morbid conditions the nature of the antigen is of no account, the individual affected is all important. In the case of animal emanations, plant pollens, chemical irritants, drugs and bacterial infections, the mode of infection may be via the nose, throat, or skin but the majority are via the alimentary canal.

In normal persons in good health the absorption of potentially antigenic protein substances from the alimentary canal into the general circulation does not occur, for even if they pass through the intestinal wall they are fixed and modified by the hepatic cells, and the functional insufficiency of these cells is the chief factor in predisposing to sensitization towards antigens absorbed from the bowel. See also Hypersensitiveness.

ALOPECIA AREATA

The cause is unknown. Treatment is by local stimulation of the hair follicles, the most effective being ultra-violet light by the mercury vapour lamp, if this is not available try direct exposure to sunlight or:—

R. Liq. Amm. Fort.	℥ss	or R. Tr. Cantharidis	m 80
Chloroformi	℥ss	Liq. Amm. Fort.	℥ij
Olei Sesami	℥ss	Sp. Rosmarini	m 20
Olei Tămonis	℥ss	Glycerine	℥ij
Spt. Rosmarini ad.	℥iv.	Olei Amygdalæ	℥vi
		Aqua Dest. ad.	℥iv

Pure Carbolic Acid followed immediately by the application of alcohol is frequently very effective.

It should be remembered that the condition is probably contagious.

AMENORRHŒA

This condition may be apparent or real, if real it may be congenital or acquired.

Apparent amenorrhœa is due either to an imperforate hymen or to a partial or complete absence of the vagina. Congenital amenorrhœa may be due to any defect in the menstrual cycle. Thus it may depend on the absence or imperfect development of the uterus, absence or defective secretion of the ovarian hormones œstrin and progesterin from the corpus luteum, disease or defective secretion of the pituitary body, not exercising its normal function over the ovaries, or finally defective thyroid secretion, although the exact effect of the thyroid activity on menstruation is not as yet understood.

Acquired amenorrhœa apart from the physiological causes of pregnancy, lactation and the menopause is due to derangements of health, especially chlorosis and defective ovarian, pituitary or thyroid activity. The following prescriptions have proved of value:—

R Mag. Sulph.	3j	R Ferri. Sulph. Ext.	gr. 1
Quin. Sulph.	2 gr.	Ext. Nux Vom.	gr. 1
Ferri Sulph.	1 gr.	Acid Arseniosi	gr. 1/60
Acid Sulph. Dil.	10 m	Ext. Hyos.	q.s.
Aqua Menth. Pip. ad.	3ss		
	t.d.s.		t.d.s.
			One pill t.d.s. after food.
R Ext. Thyroides	gr. 1	R Ext. Ergotæ	gr. 1
	t.d.s.	Apiol	m 3
			For one capsule t.d.s.
			If due to chills, hot douching,
			hot baths.
R Apiol	1 gr.	R Pot. Permang. or the	
		Lactate	1/2 to 2 gr.
			In pills 3 or 4 times daily after
			meals.

AMPUTATION, THE QUESTION OF

This is a most important question, as, in my experience, treatment in Indian hospitals, as a rule, does not err on the side of conservatism.

Every point of view must be carefully considered, for example, the age of the patient. While the surgeon might decide to amputate in the case of an aged and debilitated patient, he would not do so in a similar injury in a young healthy wage-earner with plenty of recuperative power.

Again, the surgeon should be guided in his decision as to whether the upper or lower extremity is involved; while artifi-

cial limbs are now so well made that the wage-earning capacity, an enjoyment of sport and outdoor exercise, is little interfered with by an artificial leg, an artificial hand or arm is a very poor substitute, no matter how skilfully made, so that as much as possible of the hand should always be preserved.

The social position and sex of the patient should also be considered. Some thought should also be given to the artificial limb maker: in the leg, the line of amputation not being higher than 4 in. from the lower edge of the patella, or lower than 8 in. from the ground. In the thigh, not lower than 4 in. below the lower edge of the great trochanter and about 4 in. above the upper edge of the patella.

Primary amputation should be carried out if—

1. The limb is disorganized, as it is when caught in the cogwheels of machinery.
2. Great laceration of muscle and opening up of muscle planes.
3. Vessels are divided so that gangrene will most probably supervene.
4. The principal nerves are so damaged that the limb, if saved, would be useless.
5. Severe infection develops in a case which was at first doubtful, especially if the infection is due to the organisms of gas gangrene.

Save as much of the limb as possible, and plan each amputation to meet the needs of the case.

AMPUTATION STUMPS

May require treatment for adherent or bulbous nerves, persistent infection, or spurs of bone spreading into adjoining muscles.

ANÆMIA

First consider the classification.

CLASSIFICATION

A. PRIMARY (*No recognized cause*):—

- (1) Chlorosis.
- (2) Pernicious Anæmia.
- (3) Aplastic Anæmia. Rare.

B. SECONDARY (*A recognizable cause present*):—

- (1) *From Arterial Hæmorrhage*.—Wounds, Hæmoptysis, Hæmatemesis, Uterine, Intestinal, Hæmorrhoids.
- (2) *Blood Diseases*.—Purpura, Scurvy, Hæmophilia and Leukæmia.

(8) *Parasitic Diseases* :—

- (a) *Anchylostomum Duodenale*.
 (b) *Bilharzia Hæmatobia*.

- (c) *Bothriocephalus Latus*.
 (d) *Filaria*.

(4) *Toxic Conditions* :—(a) *Inorganic* :—

Lead. Arsenic. Mercury.

(b) *Organic* :—

Malaria. Syphilis.
 Sprue. Acute Specific Fevers.
 Kala-azar. Bright's Disease.
 Malignant diseases. Typhoid, etc.

(5) *Long Continued Drain of*.—Prolonged lactation, Leucorrhœa, Discharging sinuses.

(6) *Certain Diseases of the Spleen, Lymphatic Glands and Bone Marrow*.—Splenic Anæmia, Hodgkin's Disease, Chloroma.

CHLOROSIS.—Treatment should be directed to the correction of the gastric and intestinal disturbances which are nearly always present in these cases. There should be good hygienic and climatic surroundings, but high altitudes should be avoided, as the rarefied atmosphere combined with deficient hæmoglobin causes dyspnoëic distress. A diet containing articles of food rich in iron such as spinach, apples, strawberries, oats, peas, beans, lentils and beef.

Medicinal treatment consists in the administration of Iron, in the first instance the stronger preparations nearly always disagree and the following is recommended :—

R Ferri et Amm. Cit.	...	...	gr. 15
Liq. Bismuthi Amm. Cit.	...	...	3j
Liq. Arsenicalis	...	...	m 5
Aquam ad.	...	...	3ss
t.d.s.p.c.			

The bowels at the same time should be kept freely open. Aloes is effective and said to increase the action of the iron. The object in view is not only to restore the normal percentage of Hæmoglobin but to enable the tissues to lay up a reserve, and with this object iron should in the first case be taken for at least ten weeks, and then recommenced in a reduced quantity and given for several months. For this one of the following prescriptions recommended for Secondary Anæmia should be given.

SECONDARY ANÆMIA.—Speaking generally, rest in bed and purgation form important part of the treatment, and, as a rule, one of the milder preparations of iron should be used in the first instance.

R Ferri et Amm. Cit.	gr. 8	R Ferri Carb. Sacch.	gr. 10
Tr. Quinine	m 30	Pulv. Calumbæ	gr. 2
Syrup Aurantii	5j	Pancreatin	gr. 1
Inf. Aurantii Co. ad.	3j	For one cachet t.d.s.	
t.d.s.			

R Ferri Sulph. Exsicc.	gr. 2	R Acid Arseniosi	gr. 1/80
Strychninæ Sulph.	gr. 1/60	Ferri Redacti	gr. 2
Acid Arseniosi	gr. 1/80	Quinine Sulphate	gr. 1
Syrup Simplex	q.s.	Ext. Gentian	q.s.
Twice daily.		one pill.	
		Twice daily after food.	
R Tr. Nux Vom.	m 5	R Liq. Strychnine	m 5
Acid Nitro. Hydrochlor. Dil.	m 10	Liq. Ferri Perchlor.	m 10
Syrup Aurantii	3ss	Glycerine	m 30
Inf. Aurantii ad.	3j	Aq. Dest. ad.	3ss
t.d.s.		t.d.s.	

PERNICIOUS ANÆMIA.—The treatment turns on the administration of liver. $\frac{1}{2}$ lb. should be given daily, preferably young pig's liver, but ox, calf, or other animal may be used. If for any reason fresh liver cannot be given, the equivalent in liver extract of $\frac{1}{4}$ to 1 lb. should be substituted. The liver may be eaten raw in sandwiches, fried or stewed, but should have as little cooking as possible. Gastric extract has been given, but as a rule is less potent, it is put up in 10 grm. bottles, of which four are given daily to commence with. There are cases where a combination of liver and gastric extract appear to be more useful than either separately. Liver treatment has good effect in cases of Combined Sclerosis either in preventing its onset or improving the symptoms in early cases, provided the Hb is kept at or over 80 per cent. and the red cells at 4,500,000.

No other treatment is necessary beyond rest and giving Acid Hydrochlor. Dil. 3j in orange or lemonade t.d.s.p.c. Blood transfusion and Arsenic are now rarely required. Should failure result, it is almost certainly due to not giving sufficient liver or a defective extract, or the presence of an infection which as in diabetes has an adverse influence.

The treatment of the other causes of Anæmia consists in removing the cause, and these are dealt with under each respective head.

See also article—Recent Advances in Medicine.

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ANÆSTHESIA, GENERAL—*See* Special article.

ANÆSTHESIA, LOCAL—*See* Special article.

ANÆSTHESIA, SPINAL—*See* Special article.

ANAPHYLAXIS—*See* Hypersensitiveness.

ANCHYLOSTOMIASIS

The most recent and satisfactory treatment is Carbon tetrachloride. No preliminary treatment is necessary. An aperient such as Sodium Sulphate ʒj is given early the following morning, and a colon wash out of 2 per cent. Sod. Bicarb.

R Carbon Tetrachloride ʒj. Oleum Chenopodium m 15. Divide into 3 doses of 25 m each.

ANEURYSM

The terrible pain of aneurysm is more rapidly and lastingly relieved by Potassium Iodide than by any other drug.

The dose should be 20 gr. gradually increased to 30 gr. t.d.s. Fortunately, patients suffering from this condition generally show a remarkable tolerance to large doses.

Amyl Nitrite is also of service, and vonesection in extreme cases generally gives marked relief.

The treatment of aneurysm in the limbs has been carried out by pressure either directly over the sac or the supplying vessel. There are many objections to pressure treatment; it is very painful, prolonged, uncertain, liable to relapse, and not free from danger.

Excision of the Sac has been extensively practised, but Matas Operation, by which the aneurysm is obliterated by a series of tier sutures, is undoubtedly the best operation.

ANGIOMA

Of the several forms. Spider nævus is usually cured in two sittings by electrolysis. Post-wine stains are not frequently improved by treatment, X-rays and Radium have been tried. Caver-

nous nævi should be treated with the Radium plaque or CO_2 . The large nævi common on the scalp of infants are successfully treated by CO_2 snow.

ANGINA LUDOVICI

In this cellulitis of the neck, the general toxæmia should be treated with saline purgatives. A mouth-wash given and a careful watch kept for signs of laryngeal obstruction. Locally fomentations, and should the course be progressive, multiple deep incisions down and through the deep fascia should be made, a general anæsthetic being avoided if possible. If the organism can be isolated a vaccine should be made.

ANGINA PECTORIS

Treatment divides itself into (1) the treatment of the paroxysm and (2) if possible, the prevention of its recurrence. For the Paroxysm give Amyl Nitrite capsules not less than 5 m, broken in a handkerchief and held close to the nostrils. A tablet of Nitroglycerin (Trinitrin) gr. 1/100 is slower to act, but the action is more prolonged and preferred by some patients. There is no reason why these remedies should not be used several times a day over indefinite periods. If there is flatulent distension, give Brandy in hot water. The above treatment failing, give Chloroform inhalations or Morphia subcutaneously.

Drugs used for the relief of Angina Pectoris:—

<i>Preparation</i>	<i>Dose</i>	<i>Method</i>	<i>Speed</i>	<i>Duration</i>
Amyl Nitrite	... 2 to 5 m	Inhalation	A few seconds	A few minutes.
Nitro-Glycerine	... 1/100 gr.	Crushed tablet under tongue.	1 to 2 minutes	$\frac{1}{2}$ to 1 hour.
Sodium Nitrite	... 1 gr.	By mouth	5 to 10 minutes	1 to 2 hours.
Erythrol Tetranitrate	... $\frac{1}{2}$ gr.	By mouth	$\frac{1}{2}$ hour	3 hours.

PREVENTION OF ATTACKS.—If these are frequent, order complete rest in bed for three or four weeks, this is most beneficial. Life must be so ordered that physical activity is reduced to the level at which pain is avoided. Walking quietly on the level is nearly always possible. Warm clothing, warm bed-room and a warm bed. Avoid sudden exertion or shock of any kind such as cold bath, unsuitable meals, etc. Regular medicinal treatment is not encouraging and consists of either Pot. Iodide or Nitrites, the latter are the less efficient, and the dose of the former varies in each case and should be given intermittently. Recently Lacarnol 20 m per day has proved useful. The operative treatment of left cervical sympathectomy has not been successful

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ANGINA OF VINCENT (ULCERO-MEMBRANOUS TONSILLITIS)—See Disease of the Throat.

ANTEPARTUM HÆMORRHAGE—See Obstetrics.

ANOREXIA NERVOSA

This is a manifestation of hysteria and confined to women. The case must be treated in a special institution under good nurses. For details of treatment a book on Psychoneuroses should be consulted.

ANTHRAX

Local measures such as excision or cauterization of the lesion have now been abandoned. If available, anti-anthrax serum should be given in large doses 40 c.c., the first intravenously and subsequently subcutaneously, this is followed by marked improvement in the local and general condition. If serum is not available, very good results have been obtained with Salvarsan 0·6 to 0·9 gr. given intravenously the first day, and repeated the next day. Rarely a third injection is required on the fourth day.

ANTIGEN THERAPY—See article on Specific Therapy.

ANURIA—See Urine, Suppression of.

ANUS

ANAL ABSCESS.—See Abscess.

ANAL EPITHELIOMA.—Radium gives the best results and should be employed when complete excision is contra-indicated or the patient is old. Operation is the same as for carcinoma of the rectum except that inguinal glands must be removed.

~~INTERNAL~~

* *

ANAL PAPILLOMATA WARTS.—Apart from condylomata which except for the constitutional condition require no special treatment. The ordinary white wart is cured by dusting with Calomel or touching with Copper Sulphate.

ANAL FISSURE.—This condition should never be neglected as it often causes fistula. Palliative treatment with ointments or stretching of the sphincter even in slight cases is not always successful, an operation is reliable and permanent. Under anæsthesia an incision is made right through the base and well out on to the skin, the cut must be deep enough to divide all the tissues of the base and outer fibres of the external sphincter. There is no necessity to divide the sphincter muscle, adequate drainage is essential, the edges of the wound are trimmed off so as to leave a flat surface. Dressings must be made daily and the patient kept lying down until the wound is completely healed.

It should be remembered that the symptoms of anal fissure are either intense pain, intense pruritus or no symptoms at all, if there is blood, suspect fistula.

If for any reason operative treatment cannot be carried out, successful treatment has been recently reported with A.B.A. 2 c.c. injected not through the mucous membrane but into the sphincter, or the application of one of the following:—

R Anæsthesin	gr. 70	or R Bismuth Subnitras	ʒij
Lanoline	ʒiij	Calomel	gr. 15
		Cocaine Hydrochlor.	gr. 8
		Vaseline ad.	ʒj

ANAL FISTULA.—There is no treatment of any avail except operative, and the sooner this is performed the better, as the longer it is delayed the more severe will be the operation. Whatever the kind of fistula the operation is the same in each case, which consists in laying open the fistula with a grooved director and knife, success entirely depends upon laying open all side-tracks and pockets. Straight fistulæ should be dissected out, tortuous fistulæ should be laid freely open and all granulation tissue scraped away, and the edges cut clean leaving a wound with the freest possible drainage. The sphincter should never be completely divided at the first operation, but at a secondary operation two or three weeks later, and then only if absolutely necessary. The wound must be lightly packed, not plugged, and the patient not allowed up until soundly healed.

ANUS IMPERFORATED.—(a) If the anus is present and only a septum obstructs, divide this by a longitudinal incision. (b) If the anal sphincter is absent a left inguinal colostomy should be done in all cases, as otherwise incontinence of fæces is inevitable.

able. If the bowel opens into the urethra, bladder or vagina, the fistulous tract may then close without further operation.

APOPLEXY

Give absolute rest by putting the patient on his back, with head turned slightly to one side, and the jaw held forward to prevent the tongue falling to the back of the throat and causing asphyxiation. All clothing should be loosened about the neck, an ice bag placed on the head and hot water bottles to the feet. A dose of Calomel should be placed on the back of the tongue. If the pulse is full and incompressible, venesection may be considered. The patient should, if possible, be kept in the room where the seizure took place for at least 12 hours, and when removed taken in an ambulance.

Note.—Apoplexy never causes sudden death.

APPENDICITIS, ACUTE

All cases should be operated on without delay. This advice would probably not meet with general approval; but what is gained by delay? For example, if the case is one of the sub-acute catarrhal type, operation is necessary as soon as the attack becomes quiescent in about ten days, as the great majority of these cases recur, and each recurrent attack is more severe, and there is greater risk of suppuration. During these ten days' wait, the patient is exposed to the dangers of suppuration. The risk of the formation of pus and loss of time to the patient more than counterbalance the slighter degree of safety in an interval operation. And if pus does form, the patient will most probably have to submit to two operations, one for the evacuation of the pus and subsequently another for the removal of the appendix under more difficult conditions.

There are, however, surgeons who consider that when the case is first seen 48 hours or more after the onset, *i.e.*, when the disease has spread outside the appendix, the patient should be put in Fowler's position, with nothing but water by the mouth, rectal saline and gastric lavage for vomiting, and the case watched for twelve hours. If there is then no improvement, operation must be performed. The point with these surgeons is that if the symptoms subside the appendix is removed ten days after the temperature has been normal, and drainage is thereby avoided, or if a tube is necessary, it can be removed within 48 hours.

In CHILDREN, all agree that operation should be carried out immediately in all cases; delay is very fatal.

In FULMINATING APPENDICITIS, immediate laparotomy is the only hope, but the chances of saving the patient are very remote, unless the exudate is seropurulent and limited to, or mainly, pelvic.

WHEN AN ABSCESS HAS FORMED.—A small incision should be made over the apex of the swelling, muscles split and peritoneum opened with great care. The pus is allowed to escape slowly and the cavity explored with the finger. Should the appendix be felt, it is removed after ligature of the base, but no extended search must be made, as there is danger of breaking down adhesions walling off the abscess from the general peritoneum.

The cavity must be drained even if the appendix is removed and the wound sutured in layers.

If the appendix is not found, it must be subsequently removed, but not before the abscess wound has been completely healed for a month.

APPENDICITIS, CHRONIC

The pain in chronic appendicitis is never localized in the right iliac fossa, the attacks come on at irregular intervals and are either epigastric, umbilical or left iliac, this is the first group of cases, the second group are associated with dyspepsia, the diagnosis that the appendix is the cause of the trouble, should only be made after the whole abdomen has been explored through an incision. Unless this is done gall-bladder disease or a chronic ulcer may be overlooked, and another operation becomes necessary.

ARTERIO-SCLEROSIS AND HIGH BLOOD PRESSURE

High B.P. may be defined as continued pressure above 150. Variations of 10, 20, 30 or 40 mm. Hg. in daily pressure do not matter.

AVERAGE BLOOD PRESSURE IN THE U.S.A. AND CANADA.

<i>Age.</i>		<i>Systolic.</i>	<i>Diastolic.</i>
20	...	120	80
25	...	122	81
30	...	123	82
35	...	124	83
40	...	126	84
45	...	128	85
50	...	130	86
55	...	132	87
60	...	135	89

Causes of High B.P. are: Hereditary, age, males over 40, strenuous work as of doctors and merchants. Over-nutrition as in testotolers, disturbances of the endocrine glands, long continued focal sepsis. Excessive smoking and alcohol have not been proved to be a cause.

It is important to recognize definite varieties of cases:—

1. Patients with high B.P. but no symptoms.
2. Patients with headache, vertigo, tinnitus and epistaxis.
3. Cardiac cases, with palpitation and cardiac discomfort.
4. Coronary Thrombosis.
5. Cerebral cases, with loss of memory, impairment of motor power and hæmorrhage.
6. Renal cases, resulting in uræmia, these are the least common.

The patient generally complains of one or more of the following symptoms—Headache, vertigo, dyspnœa, palpitation, languor, disturbed vision and insomnia.

BAD PROGNOSTIC SIGNS.—Are renal changes and albuminuria, Pulsus Alternans or galloping rhythm, increased weight. With cardiac failure especially if the B.P. is falling and œdema is present the patient will live under a year.

TREATMENT.—The mental attitude is of the first importance, it should be relaxation of mind and body, largely giving up work and taking moderate exercise such as golf and walking, but avoiding any sudden exertion. Diet is of the first importance in the obese, a limited fluid and salt intake is helpful, but meat red or white is not now considered so pernicious as formerly; and a moderate amount may be allowed in a mixed diet of which the greater part consists of fresh fruit and vegetables. If symptoms are troublesome, rest in bed is a great help.

The following can be recommended:—

R Tr. Veratri Viridis ... m 15

The tabloid Sodii Nitritis Co. (Burrough Wellcome and Co.), which contains sodium nitrite, erythrol tetranitrate, mannitol nitrate and ammonium hippurate, will often relieve the symptoms of acute exacerbations of Hyperpiesis.

R Sodium Nitrite	gr. $\frac{1}{2}$ to 2	R Lithium Hippurate	gr. 2
Ammonium Hippurate	gr. 7 to 10	Sodium Nitrite	gr. 1
Sodium Bromide	gr. 10 to 15	Nitroglycerine	gr. 1/200
Sp. Chloroform	m 10		
Collosol Iodine (Crook's)	3j		
Distilled Water	3j		

t.d.s.p.c. well diluted.

R Acetyl-Choline $\frac{1}{2}$ gr. subcutaneously or intramuscularly and 1 $\frac{1}{2}$ gr. the following day.

R Thyroid Extract is of value in certain cases especially at the menopause. Calcium salts either combined with Parathyroid gland or Diuretin have been recommended. Calcium Lactate 10 to 15 gr., Parathyroid 1/10 gr. daily. Liver Extract has been given on the supposition that the detoxicating functions of the liver are not acting. Anabolin $\frac{1}{2}$ to 1 c.c. intramuscularly daily for seven days is given for the same reason, it is then followed by Anabolin tablets.

Alimentary Toxæmia should be treated by:—

R Liq. Paraffin $\mathfrak{z}\text{ij}$ daily. R Kaylene Saline $\mathfrak{z}\text{ss}$ twice daily.

This is an effective absorbent of intestinal toxins.

• **VENESECTION.**—Does not effect the pressure but improves all symptoms. It may be used for sudden exacerbations with violent headache, substernal pain and cardiac distress or as a periodical treatment. Remove 15 to 20 ozs. varying with the physique of the patient.

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ARTIFICIAL AIDS TO HEARING—See Diseases of the Ear.

ARTHRITIS DEFORMENS—See Osteo-Arthritis and Rheumatoid Arthritis.

ARTHRITIS, GONORRHOEAL

If posterior urethral lavage has been efficiently carried out this complication will not arise. For the developed condition rest in bed is essential. Disinfect the posterior urethra by irrigations. Vaccines give excellent results, if possible use an autogenous vaccine, if this is not obtainable, use a stock gonococcal vaccine plus non-specific organisms. Give large doses, the first 150 M.

Locally I have had good results with Bier's hyperæmic treatment using an Esmarch's bandage above the knee. For

the pain, paint with Iodine or give radiant heat baths. When the acute condition has subsided massage and movements are absolutely essential. For marked hydrarthrosis pressure with an elastic bandage, this failing, aspirate, and at once bandage tightly to prevent refilling.

ARTHRITIS, OSTEO- AND RHEUMATOID—*See* Osteo-Arthritis and Rheumatoid Arthritis.

ARTHRITIS, SUPPURATIVE

In mild early cases aspiration repeated if necessary is often sufficient combined with a splint and possibly extension. If severe the joint should be opened and irrigated with Carrel's tubes and Dakin's solution, but tubes from the point of view of drainage are useless. Careful judgment is required as to whether the joint should be immobilized on a splint or movements given. In the former case the joint should be put up in such a position, that the limb will have the maximum of utility should ankylosis ensue, movements have the advantage of draining out the discharge and giving subsequent mobility. Bier's method of Passive congestion at times gives good results.

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ASCITES

The chief causes are:—

1. Diseases of the Peritoneum.
2. Chronic Failure of Right Heart. (Backward pressure.)
3. Bright's Disease.
4. Disease of the Liver.

These conditions are dealt with under the above heads.

ASPHYXIA

Respiration is often arrested by conditions which prevent the access of air to the lungs, such as drowning, foreign bodies,

throttling, thuggee, irrespirable gases, general anæsthesia, and electrocution.

TREATMENT.—1. The cause of the asphyxiation is first removed, in the case of a foreign body, by sweeping the index finger round the pharynx; in drowning, by inverting the patient so as to remove the water from the air-passages.

2. Artificial Respiration by:—

(a) SYLVESTER-HOWARD METHOD.—The patient being on his back, with shoulders and chest raised, the operator, kneeling or standing at the patient's head, seizes the patient's bent arms firmly at the elbows, and carries out the movements of expansion and compression deliberately and evenly, at the rate of 16 to 18 per minute. An assistant at the same time aids compression and expansion, with his hands over the lower ribs.

(b) SCHAFER METHOD is especially useful, when the operator is alone. The patient is laid in the prone position, on his abdomen, the face being turned slightly to one side, and a blanket placed under the chest. The operator, kneeling across the patient, causes compression and expansion of the patient's chest, by alternately throwing his weight on to the patient's back, by his hands being spread out on each side of the spine, and then relaxing.

The Sylvester-Howard method is preferable, as the expansion of the chest is greater.

Artificial respiration should be kept up for at least two hours.

3. Slapping the patient's body or face with a towel rung out of ice-cold water.

4. Forcible dilation of the Sphincter Ani.

5. Tongue Traction. The tip of the tongue is seized with the handkerchief-covered fingers, and the organ is rhythmically and fairly forcibly drawn out, at the rate of sixteen times to the minute. This is a valuable adjunct to artificial respiration.

6. Intravenous use of warm Saline Solution 105° F., with 20 m of 1:1000 Adrenalin Chloride Solution, added drop by drop to the Saline Solution, by sticking the needle of the hypodermic syringe into the rubber tubing conveying the Saline.

Or the direct injection of Adrenalin, with a little Saline, into the jugular vein in extreme cases.

7. In cases of syncope, inject 5 minims of Adrenalin into the heart, or open the abdomen and massage the heart through the diaphragm.

ASTHENOPIA

Headaches or pain in or around the eyes should lead to a careful examination for (1) Any error of refraction, (2) Insufficiency of the external muscles or (3) Organic disease of the media or fundus.

ASTHMA

The exact nature of asthma is unknown, there are two theories—urticaria of the bronchial mucous membrane, and spasm of the bronchial muscle. The exciting factor may be neurosis, irritation of the respiratory tract or naso-pharynx. Idiosyncrasy to certain articles of food or perverted metabolism, emanations such as from pollen, skin, hair, feathers and chemicals.

The treatment is divided into:—

(a) DURING AN ATTACK.—Adrenalin Hydrochlor., 2 to 5 m of a 1 in 1000 solution, may act with remarkable effect, if given at the beginning of the attack.

Ephedrine by mouth in $\frac{1}{2}$ gr. doses, it is closely allied to Adrenalin but slower in action. It is particularly useful in preventing nocturnal attacks.

In some patients the attack can be cut short by clearing the alimentary canal with an emetic and enema. Smoking Stramonium cigarettes or burning Nitro or the following paper may be of service:—

<i>Spasmodic Asthma</i>		<i>Charta Anti-Asthmatica</i>	
R Liq. Ext. Grindelia	15 m	Potassium Nitrate	17 parts.
Tr. Belladonna	10 m	Ext. Stramonium	10 "
Sod. Bromide	15 gr.	Sugar	20 "
Mucil. Acaciae	3ss	Hot Water	100 "
Aqua Chloroformi ad.	5j	Dissolve the solids in the hot water, and with the solution saturate white filter paper, and dry.	
<i>Bronchial Asthma</i>		<i>Asthma of Gastric Origin</i>	
R Liq. Ext. Grindelia	15 m	R Liq. Ext. Grindelia	10 m
Pot. Iodide	2 gr.	Tr. Camph. Co.	3ss
Trinitrin	1/200 gr.	Tr. Lobelia	10 m
Tr. Euphorb. Pilulif	20 m	Spt. Chloroform	15 m
Aquam ad.	3ss	Mist. Ammoniaci ad.	5j
One or two doses every 2 or 4 hours until relieved.		2 or 3 times daily.	

(b) BETWEEN THE ATTACKS.—Potassium Iodide is very efficient in the permanent cure of the asthmatic subject. It should be commenced in small doses and gradually pushed up to 30 gr. t.d.s. If given with 2 m of Liq. Arsenicalis and 2 m Tr. Nux Vom., no unpleasant symptoms will result. The treatment should be intermittent, but the most severe cases are cured in a year.

R Acid Hydrochlor. Dil.	...	...	20 m
Liq. Strychnina	...	...	5 m
Liq. Arsenic Hydrochlor.	...	...	4 m
Aqua Menth. Pip. ad.	...	...	3ss

t.d.s. after food with 3j of water between the attacks.

Cough Mixtures in Asthma.

R Pot. Iodide	gr. 3	R Pot. Iodide	gr. 8
Tr. Stramonium	m 4	Amm. Chloride	gr. 15
Ætheris Chlorici	m 5	Glycerine	m 20
Liq. Ext. Glycyrrh.	m 20	Liq. Ext. Glycyrrh.	m 20
Aquam ad.	3j	Aquam ad.	3ss

The above are given in order to cough up phlegm to make the breathing easier.

Whole Blood injection in Asthma—2 c.c. of blood are withdrawn from a patient's vein and at once re-injected subcutaneously, repeated weekly for two or three months has given excellent results in many cases. Recently Oriel has isolated a proteose from the urine of asthmatic and eczematous patients, which is specific to each case, minute doses of which have served to desensitize the patient. Specific treatment has also been used to desensitize with small doses of the offending Protein, or by the non-specific method of Protein Shock with milk or peptone.

A mixed Coliform Vaccine prepared from all the organisms growing in the intestine is said to be the most certain and lasting method of curing Asthma.

ASTHMA IN CHILDREN

This condition is sometimes definitely associated with Adonoids and disappears after their removal.

Burney Yeo recommends the following mixture.—

R Antimon. Tart.	gr. 1/20	R Syrup Scillæ	3ss
Liq. Morph. Hydrochlor.	m 2	Syrup Tolu.	3ss
Pot. Iodidi	gr. 2	Vinum Ipecac	m 5
Spt. Chloroformi	m 2	Sacch.	q.s.
Aquam ad.	3ij	Aqua Anisi ad.	5ij

With an equal quantity of water
every 8 hours for a child of
5 or 6 years.

ACIDOSIS IN ASTHMA.—This type is more often found in children, but it does occur in adults. Examine the urine for Diacetic Acid, if found give Glucose with Sod. Bicarb. ʒj and Pot Cit. ʒss.

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BACILLURIA

This term should be reserved for urine which contains large numbers of B. Coli, but no other abnormal constituent, such as pus or blood, showing that there is no inflammation of the urinary tract. In some patients it is transient or intermittent, in others it persists for months with constant relapses. It is much more common in the female sex, and four times more common in girls than boys. The principles of treatment are the same as for pyelitis. *See Pyelitis.*

See also article—Recent Advances in Medicine.

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BACKACHE

The causes are:—

1. Diseases of the spine—Tuberculosis, Arthritis and Secondary Carcinoma.
2. Trauma and mechanical strain.
3. Alimentary System—Hæmorrhoids and Constipation.
4. Genito-Urinary System—Kidney and Prostatic disease.

5. In Women—Pelvic and Uterine disease, menstrual backache and backache with no definite cause.

TREATMENT.—Septic foci should be looked for and removed if possible, an autogenous vaccine being given. Manipulation succeeds frequently in quite unexpected cases, while others are better for a sacro-iliac belt. Some cases are due to driving a car with the seat too far from the pedals. Menstrual backache often benefits from:—

R Guaiacum Resin 10 gr. In cachet t.d.s.

Those cases with no definite cause are better for:—

R Pot. Iodide	...	...	...	20 gr.
Pot. Brom.	...	...	...	20 gr.
Tr. Colchici Sem.	...	...	...	3j
Syrup Aurantii Cort.	...	...	...	3j
Aquam ad.	...	...	...	3j

Three or four times daily until the bowels are slightly acted upon (*Kelly*).

BALANITIS

In acute cases is usually Gonorrhœal and the prepuce should be slit up to the coronal sulcus, in subacute and chronic cases circumcision except in gouty and diabetic patients. In all cases boracic lotion should be frequently applied, and gauze wrung out of lead lotion to separate inflamed surfaces. In the diabetic form Thomson-Walker recommends a powder of Starch, Zinc Oxide and Boric Acid, with Zinc Oxide ointment applied to the inflamed skin of the penis and scrotum.

BALDNESS—See Alopecia Areata.

BATHS—See Hydrotherapy.

BED SORES

PREVENTION.—Any spot showing the slightest tenderness or redness over the sacrum, hips, heels or elbows should be lightly but firmly rubbed with Soap, and then with Methylated Spirit; finally well dusted with Zinc and Starch powder. If a sore is threatening, Ung. Zinci, made into a soft paste with Brandy, should be applied, and the part relieved from pressure, as far as possible, by a water pillow under the pelvis, and elsewhere pads of cotton wool.

The nurse must be careful that there are no creases in the bed linen and no contamination of the skin with feces or urine.

When the skin has given way, the wound must be dressed constantly. The best plan is to cut a piece of lint to the size

of the ulcer, soak it in Tr. Benzoin Co., and cover with a large piece of dry lint.

If the skin has sloughed, Boric Acid fomentations should be applied; and when the wound is clean, stimulating dressings of Scarlet Red.

BERI-BERI

A deficiency disease due to the absence of Vitamin B. The chief sufferers are those who eat polished rice. As regards treatment complete rest lying down is essential, the chief danger is from cardiac dilatation due to paralysis of the vagus. When the danger of cardiac crisis is past, the neuritis must be treated by Strychnine injections, massage, faradization and splints when necessary.

BILHARZIASIS

Tartar Emetic given intravenously in increasing doses is a specific. The initial dose should be $\frac{1}{2}$ gr. dissolved in 5 c.c. of distilled water with 5 per cent. glucose. The dose should increase until 2 gr. are given for a single dose. In order to kill the adult worm a course amounting to 25 gr. is required spread over a period of three weeks. Fuadin (Bayer) is also very effective and has the advantage that it can be given subcutaneously or intramuscularly. The symptoms due to the passage of the eggs through the mucosa may be alleviated by local measures.

BIRTH PALSY

This is due to traction on the brachial plexus in difficult labour either head or breech presentation. The injury is usually to the fifth or fifth and sixth nerves, so that the arm is held to the side, rotated in, elbow extended and some pronation of the forearm. Treatment consists in fixing the arm in a splint in such a position that the paralysed muscles are relaxed, the splint is worn day and night, but removed three times daily for massage and passive movement.

BLACKHEADS.—*See* Acne Vulgaris.

BLACKWATER FEVER

Revised by Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

May, 1934.

The following are the conclusions of research work on the subject, by Drs. Arkwright and Leiper, published in the 'Transactions of the Society of Tropical Medicine':—

(1) Blackwater fever is due to malaria.

(2) It is predisposed to by a prolonged malarial infection.

(3) The attack of blackwater fever is precipitated by a relapse or recurrence of malaria.

(4) Before the onset of blackwater fever, the patients had (a) arrived in a malarious country on an average $11\frac{1}{2}$ months—maximum 16 months, minimum 7 months; (b) had the first recognized attack of malaria on an average 5.0 months—maximum $8\frac{1}{2}$ months, minimum 50 days; (c) arrived in a country previously free from both malaria and blackwater fever on an average 87 days—maximum 5 months, minimum 1 month.

(5) Quinine, in the class of cases with which we have met, has had no share in producing blackwater fever; nor has quinine treatment, during or after the attack, had any effect in prolonging or reproducing the hæmoglobinuria.

(6) The jaundice of blackwater fever is, certainly in some cases, due to bile pigment in the circulation.

(7) It is possible to estimate the total blood pigment, passed in urine of blackwater fever cases, by a modification of Sahli's method. The amount of hæmoglobin passed in the urine is only a small part of that set free in the body.

(8) The treatment which appeared to be of most value was intravenous or rectal administration of hypertonic saline.

Note.—The hypertonic saline solution used in cholera is far better than isotonic saline for intravenous use in this disease, as it often stops the hæmolysis at once and leads to excretion of the toxins through the kidneys.

Rogers' alkaline saline solution intravenously with the hypertonic one, as recommended in the treatment of cholera, is useful in preventing uræmia.

The investigation of blackwater fever in Southern Rhodesia by J. G. Thomson led to similar conclusions.

REFERENCE:—

London School of Trop. Med. Res. Mem. series 1924, VI
(with many references).

Quinine should only be given during an attack of blackwater fever if malarial parasites are still present in the blood.

There are THREE FORMS of Hæmoglobinuria, which have to be considered in the tropics:—

- (1) Symptomatic Malarial Hæmoglobinuria—Is simply a hæmoglobinuria caused by the malarial parasite.
- (2) Toxic Hæmoglobinuria—Brought about by a number of drugs, such as quinine and its salts, antipyrin, carbolic acid.
- (3) Specific Hæmoglobinuria, *i.e.*, Blackwater Fever—Is an acute specific fever of unknown causation characterized by great blood destruction, resulting in hæmoglobinuria and jaundice.

TREATMENT OF BLACKWATER FEVER.—(1) The patient must be given absolute rest in bed, and carefully nursed.

(2) The treatment must be directed to keeping up a high blood pressure, with good renal secretion. This should be done by flushing out the body with quantities of fluid, either taken by the mouth or, if this is impossible on account of vomiting, by rectum, subcutaneously, or intravenously.

(3) Calcium Chloride, or Lactate, in doses of 15 to 30 gr. well diluted, should be given every four hours, but these drugs must not be continued for more than four days at a time.

(4) If malarial parasites are present in the blood, give intramuscular injections of Quinine Bihydrochloride, but no Sulphate or Bisulphate should be given.

The new anti-malarial synthetic drug, Atebrin, appears to be preferable to quinine in the treatment of blackwater fever, but plasmoquine should not be given as it has failed in some malarial cases to avert the onset of blackwater fever and it may itself produce methæmoglobinuria.

(5) Anuria must be treated by free purgation, vapour baths, cupping over the kidneys, pilocarpine hypodermically and hypertonic saline.

(6) Stimulants in the form of brandy and champagne, must be freely given if necessary. Pituitary extract is especially useful in cardiac failure.

(7) Hearsey has recommended the following:—

R Liq. Hydrarg. Perchlor.	...	...	30 m
Sod. Bicarb.	...	...	10 gr.
Aquam ad.	...	...	3j

Every 2 or 4 hours, for the first 24 hours, and then every 8 hours, until the urine clears.

REFERENCES

- Journal Trop. Med. and Hygiene, 1921, pp. 231 and 255.
Journal R.A.M.C., 1921, p. 82.

BLADDER, RUPTURED

This condition may be intra- or extra-peritoneal.

INTRA-PERITONEAL.—The rupture is on top of the bladder, and the urine passes into the peritoneal cavity. The symptoms are pain and shock of an abdominal injury and inability to micturate; there is free fluid in the peritoneum, and only a few drops of blood-stained urine are obtained on passing a catheter.

TREATMENT.—Laparotomy and suture of the rupture with Lambert suture, that do not pass through the mucous membrane. Douglas's pouch should be drained, and the patient placed in Fowler's position with regular use of a catheter.

EXTRA-PERITONEAL.—This is either in the anterior wall or at the base; in the former, the extravasated urine passes into the cave of Retzius and mounts up above the pubes, and in the latter, it passes into the cellular tissue between the bladder and rectum.

TREATMENT.—If in the anterior wall, an incision is made above the pubes down to the rupture, and a drainage tube passed through it, the case being treated as a supra-pubic cystotomy. If in the base of the bladder, the cellular tissue between the bladder and the rectum should be freely opened up by a median incision in the perineum behind the urethra, no attempt being made to suture the rent in the bladder.

BLOOD LETTING—*See* Venesection under Minor Operations.

BLOOD POISONING—*See* Septicæmia.

BLOOD PRESSURE, HIGH—*See* Arterio-Sclerosis and High Blood Pressure.

BLOOD TRANSFUSION—*See* Blood Transfusion under Minor Operations.

BOILS

These may sometimes be aborted by painting with Iodine 2 per cent. and applying Klapp's suction glass 3 times daily.

Once open, prevent the lymph from clotting by Boric fomentations, protecting the surrounding skin with Thymol Ointment. Or the slough may be removed by Klapp's suction glass, the cavity swabbed out lightly with Carbolic and covered with a Collodion dressing.

Ung. Ichthyol 15 per cent. is a very good application if the boil is a singleton. In the more troublesome cases, Staphylococcal vaccines may be used, but are not always successful. Tin is practically a specific in certain Staphylococcal infections and Tin Ox. 2 tablets t.d.s. should be tried.

The following are recommended, together with change of air to a bracing climate:—

R Sodium Glycerophosph.	...	...	gr. 1
Calcium Glycerophosph.	...	...	gr. 1
Ferri Glycerophosph.	...	...	gr. 1
Neuclein ...	...	...	gr. $\frac{1}{2}$
			for one pill.
R Calcium Sulphide	...	...	gr. 1
3 or 4 times daily.			

REFERENCES

- ASHERSON (N.) Common conditions simulating acute otitis media; aural furunculosis. *Clin. J.*, 1933, lxii, 28-34.
 WRIGHT (V. W. M.) Infections in dangerous circle of face. *S. Clin. North America*, 1932, xii, 1567-1577.
 HALLAM (R.) Recurrent boils: some points relating to aetiology, complications, and treatment. *Brit. M.J.*, 1932, ii, 670-672.
 de KEYSER. Boils and carbuncles; their treatment by oxygen. *Internat. Clin.*, 1930, iv, 1-7.
 WILLIAMS (L.) Of boils. *Practitioner*, 1930, cxxiv, 320-327.

BONE INFLAMMATION

Acute Infective Periostitis and Osteomyelitis. This condition is a surgical emergency of the first importance, and requires immediate operation. An incision should be made down to the periosteum over the area of maximum tenderness, then the periosteum is incised and the pus let out. The medullary canal should be opened with a trephine or gouge if available, if not by a carpenter's gimlet duly sterilized. A more extensive operation such as removal of dead bone should not be done, as this may lead to the spread of infection. If the pus is offensive the area should be swabbed out with Hydrogen Peroxide, otherwise with sterile saline, but not strong antiseptics. If the joint is involved try aspiration in the first place. The importance of immediate operation cannot be over-stressed, delay means extensive necrosis and great danger to life.

BONE, TUBERCULOUS DISEASE OF

The important points in the treatment of this condition are:—

- (1) Physiological rest—the bone must be saved all stress whether by weight or muscular action, by careful splinting with Plaster of Paris or Thomas splint, and the supine position for vertebral disease.

- (2) Open-air treatment and Heliotherapy, a revolution in the treatment of surgical tuberculosis has been brought about by sunlight. *See* Section on Heliotherapy.
- (3) A most important point is to keep the focus free from infection with pyogenic organisms, as it has been clearly proved that tuberculous infections of bones and joints are more prone to spread both generally and locally when infected with pyogenic organisms.
- (4) Diet is important. It should be plentiful, light and easily digested, with plenty of animal fats, cod-liver oil and milk.

* With such treatment which imitates the natural process of repair the necessity for operation becomes very rare, should an abscess form its cavity is aspirated with a two-way aspirating syringe and washed out with hypertonic saline.

BONE TUMOURS

Benign tumours are Osteoma, Chondroma, Myelomata and Cysts. Malignant are Sarcomas which may be central or periosteal or primary or secondary. Carcinomata are always secondary. Cancer of the breast, thyroid gland and prostate are especially prone to form deposits in bone, thus spontaneous fractures of the upper end of the humerus or of the trochanteric region of the femur is frequently due to scirrhus of the breast.

BOTULISM—*See* Food Poisoning.

BRAIN COMPRESSION AND CONCUSSION—*See* Head Injuries.

BRAIN, TUMOURS OF

In the treatment of intra-cranial tumours non-operative treatment is useless, treatment is surgical either radical or palliative. Earlier diagnosis and more accurate localization, with the help of X-rays and radium, are making treatment in the future more promising. Unfortunately the great majority of malignant tumours are infiltrating, and benign tumours are often in a situation incapable of removal. But palliative measures by a simple decompression operation can give great relief by stopping the intense headache for which drugs are of no avail, the distressing vomiting, averting blindness and prolonging life in some cases for long periods. Lumbar puncture should not be performed for the relief of pressure in these cases as it is dangerous. Temporary relief should be given by dehydrating con-

contrated salt solutions, the most rapid being 10 to 20 c.c. of a 30% Sodium Chloride solution intravenously.

BREAST, INFLAMINATION OF

The various forms of Mastitis can be divided into Acute and Chronic.

ACUTE MASTITIS—is usually associated with lactation and cracked nipples, but may occur during pregnancy, shortly after birth and at puberty. No sharp demarcation can be made between milk engorgement and acute mastitis terminating in abscess, the one condition passing imperceptibly into the other. It is important not to mistake mere engorgement or mastitis for suppuration, and no incision should be made unless the signs of abscess are definite.

For milk engorgement the breast should be slung and gentle massage given from the periphery to the nipple, a cold evaporating lotion applied and a mild purge given. If further lactation is not required, apply Glycerine of Belladonna and give Pot. Iodide internally. If the condition passes on to acute mastitis, hot fomentations should replace the evaporating lotion, the infant is weaned, and every measure taken to stop the secretion of milk. A careful watch is kept for signs of suppuration, should this arise it should be opened as recommended under Mammary Abscess.

CHRONIC MASTITIS.—There is a chronic lobar mastitis as the result of injury, a sequel of lactation or continual irritation. If not cured by Glycerine of Belladonna it should be strapped or mercurial ointment and firm pressure applied. If still persisting, excise the troublesome area.

CHRONIC INTERSTITIAL MASTITIS—is usually seen between 35 and 40, both breasts are generally affected without obvious cause. If mild and non-progressive without pain, local treatment with Glycerine and Belladonna or Mercurial ointment and Pot. Iodide internally should be tried. X-rays is effective in some cases. The condition is certainly precancerous in some but not in all cases, should the condition persist, removal of the breast should be advised.

TUBERCULOUS MASTITIS.—The caseous abscesses should be opened and scraped, but if the breast is extensively riddled amputation should be advised.

BREAST, NEURALGIA OF

Fear of cancer is at the root of the trouble in the majority of cases, and if after a very careful examination you can em-

platically assure the patient that there is no sign of this disease, the pain will rapidly disappear. If it persists, search should be made for the trouble in the pelvic organs or impaired general health.

BREAST TUMOUR

The benign are Fibro-adenomata and Cysts. Removal should be recommended in both cases, especially in the former as the diagnosis can never be made with absolute certainty. These tumours usually grow rapidly during pregnancy and lactation and are a worry and anxiety to the patient.

Malignant tumours should be removed at once by the radical operation, which consists in the removal of the whole mammary gland and a large part of overlying skin, both pectoral muscles, the whole lymphatic area, including the deep fascia and fat. Many successes have been achieved with radium and it has been thought that it should take the place of operation, but at the Radium Institute treatment is only undertaken in those cases in which the breast is thin and flat. Radium is very successful in dealing with inoperable cases and local recurrences, radium frequently arrests the progress of the disease for many years even in advanced cases, ulcerated areas and fungating growths may heal and remain healed. Fixed masses of glands in the axilla or above the clavicle should on no account be excised but treated by radium.

BREATH, OFFENSIVE

Cause should be sought for in the mouth, such as enlarged tonsils, pyorrhœa or carious teeth, failing these causes the patient should be treated for chronic gastritis and if the tongue is furred with exercise in the open air.

BRIGHT'S DISEASE—*See* Nephritis.

BRONCHI, FOREIGN BODIES IN—*See* Air Passages and Oesophagus, Foreign Bodies in.

BRONCHIECTASIS

This must be considered under Obstructive and Non-obstructive. The former may be due to a foreign body, pressure by tumour, aneurysm or glands, syphilitic stenosis or growth innocent or malignant. For diagnosis Bronchoscopy should be employed with the aid of Lipiodol injection if necessary. Cure is only possible in the case of foreign body or benign growth

which must be removed. The commonest cause of Non-obstructive Bronchiectasis is unresolved broncho-pneumonia, chronic bronchitis and pleural effusions are also causes. The condition may be uni- or bilateral, diffuse or localized, saccular or fusiform. As treatment is to some extent influenced by the character and extent of the lesion, an accurate knowledge of this can be obtained by lipiodol and X-rays. Treatment is best considered under: (a) General hygienic measures, such as ample fresh air and heliotherapy, a full diet with plenty of fatty foods, a warm not humid climate, and removal of any infection of the nose, throat or sinuses. (b) Postural methods with a view to emptying the cavities. (c) The creosote chamber, autogenous vaccine and diathermy in early cases have had some good results. (d) Medicinal treatment can be carried out by the inhalation of drugs by the mouth or intratracheal injections.

Useful inhalations are:—

R Tr. Benzoin Co.	3ij	or R Creosote	2 parts.
Oleum Eucalyptus	3ij	Tr. Iodi.	1 part.
Thymol	3j	Carbolic Acid	2 parts.
Spt. Chloroformi ad.	3j	Spt. Aetheris	1 part.
		Spt. Chloroformi	2 parts.
		(B.S. and F.)	

Drugs used by the mouth are Oils of Turpentine, Sandalwood and Pine, Creosote and Guaiacol Carbonate. Prescriptions:—

- R Oil of Sandalwood in capsules 10 to 30 m t.d.s.
- R Oil of Turpentine in capsules 10 m t.d.s.
- R Creosote in capsules in increasing doses up to 20 to 30 m.
- R Terebene 5 to 15 m in capsules t.d.s.

R Terebeni	m 7	R Guaiacol	m 8
Vinum Ipecac	m 7	Tr. Benzoin Co.	m 20
Tr. Benzoin Co.	m 20	Syrup Pils.	3ss
Mist. Amygdalæ ad.	3ss	Syrup Tolu	3ss
t.d.s.		Mist. Amygdalæ ad.	3ss
		In water every 4 hours.	

R Oleum Terebinthinæ	m 10	R Terpini Hydratis	gr. 1½
Mucilago Acaciæ	3ij	Heroin Hydrochlor.	gr. ¼
Syrup Tolu.	3j	Syrup Pruni Virg.	3ss
Mist. Amygdalæ ad.	3j	Glycerine	3ss
		A teaspoonful occasionally for troublesome cough.	

Intratracheal injections by mouth:—

R Thymol	8 parts.	R Creosote 5 per cent. in liquid	
Menthol	8 "	Paraffin.	
Creosote	8 "	R Lipiodol 5 to 20 c.c.	
Olive Oil	80 "		

Surgical treatment, which is beyond the scope of this book to consider in detail, includes artificial pneumothorax, collapse operations, removal of or drainage of the diseased area.

BRONCHITIS, ACUTE

If the attack is severe the patient should be in bed in a room with a temperature of 60° to 65°, he should be propped up in the bed, and wear light but warm clothing. The air may be moistened with a steam kettle to which has been added Tr. Benzoin Co. ʒj to the pint or Oil of Eucalyptus 5 m to the pint. The diet should be fluid and plenty of hot drinks should be taken. In the initial dry stage of general malaise and acute hyperæmia give:—

R Vinum Antimon.	m 10	or R Tr. Aconite	m 3
Vinum Ipecac	m 10	Vinum Ipecac	m 20
Liq. Amm. Acet.	ʒss	Liq. Amm. Acet.	ʒij
Pot. Citrate	gr. 10	Sp. Ætheris Nit.	m 20
Sp. Ætheris Nit.	m 20	Aqua Camph. ad.	ʒi
Syrup Tolu.	ʒss		
Aqua Chloroformi ad.	ʒi	Every 4 hours.	
Every 4 hours.			

In the stage of exudation with less pain, looser cough and increasing sputum:—

R Amm. Carb.	gr. 5	or R Pot. Iodide	gr. 3
Vinum Ipecac	m 10	Pot. Bicarb.	gr. 8
Syrup Scilla	ʒss	Syrup Pruni Virg.	ʒj
Syrup Tolu.	ʒj	Aqua Anisi ad.	ʒss
Inf. Senega ad.	ʒj	Every 3 hours.	
Every 4 hours.			

If the inflammation is mainly in the trachea the following is a wonderfully efficient mixture:—

Frequently however the cough will only yield to opiates given as Tr. Camph. Co. m 20, Syrup Codeine ʒss, Heroin gr. 1/12 or a Linctus such as:—

R Tr. Benzoin Co.	ʒss	R Syrup Codeine	ʒss
Vinum Ipecac	m 8	Syrup Pruni Virg.	ʒss
Syrup Pruni Virg.	ʒss	Syrup Tolu.	ʒss
Mucil. Acacia	ʒss	Aquam ad.	ʒss
Aqua Anisi ad.	ʒj	One tablespoonful whenever the cough is troublesome.	
Every 4 hours in a wineglass of water.			

Amm. Iodide in doses of about 3 gr. is valuable when the cough is dry and teasing, and there is not much sputum. Syrup Apomorph-Hydrochlor. ʒj is also useful in the same condition.

INSOMNIA.—This is best treated at the beginning of the illness with Dover's powder and Alcohol. Later by a combination of Aspirin and Medinal.

BRONCHITIS, ACUTE, IN CHILDREN

EARLY STAGE.—Bronchitis kettle and Creosote inhalation ; plenty of hot liquids to drink.

R Pot. Cit.	...	...	gr. 10
Vin. Ipecac.	...	...	m 8
Liq. Ammon. Acet.	...	...	3ss
Spt. Ætheris	...	...	m 5
Aqua Camph. ad.	...	...	3ij

Every 3 to 4 hours.

LATER STAGE.—The tubes are full of mucus, which the child cannot expectorate ; then an emetic is very useful, but must not be given if there is any cyanosis or signs of cardiac weakness ; then give :—

R Ammon. Carb.	...	...	gr. 1
Tr. Digitalis	...	...	m 1
Syrup Pruni Virg.	...	...	m 20
Aqua Anethi ad.	...	...	3j

Every 4 hours.

BRONCHITIS, CHRONIC

When bronchitis has become chronic it is almost invariably associated with emphysema, and treatment must be directed towards preventing the acute recurrent attacks. Steps must be taken to ascertain and remove the cause such as dusty surroundings, abnormal conditions of the upper air passages such as polypi, deviated septum, pus in the antra, etc.

TREATMENT.—Climate is an important factor for adults, it should be warm and dry without sudden changes, children however are better in a cold dry bracing place. Active immunization by means of an autogenous vaccine taken from the nasopharynx is beneficial in some cases, but very small doses should be given and reactions avoided.

The treatment by drugs will be determined by symptoms, a stimulating expectorant is useful, such as Amm. Carbonate and Squill in some cases, in others Amm. Chloride or Amm. Iodide, the latter being especially useful if the cough is dry and teasing, the former for long continued cough.

R Amm. Carb.	gr. 4	R Amm. Chloride
Tr. Scillæ	m 10	Vin. Ipecac
Tr. Nux Vom.	m 10	Syrup Tolu.
Spt. Chloroformi	m 20	Mist. Ammoniaci
Inf. Senega.	3ss	Aqua Anisi ad.

t.d.s.p.c.

t.d.s.

For Bronchitis of long standing.

R Amm. Iodide	gr. 3 to 5	R Syrup Tolu.	3ss
Tr. Nux Vom.	m 7	Syrup Scillæ	3ss
Sp. Anisi	m 10	Inf. Senega ad.	3iv
Inf. Senega ad.	3j	t.d.s. in water.	

When expectoration is very profuse,—

Chronic Winter Cough of the Aged with copious sputum:—

R Terebent Par.	m 10	R Liq. Picis Aromat.	3ij
Syrup Smaplex	3j	Glycerine	3ij
Mist. Amygdalæ ad.	3j	Liq. Ext. Glycyrrhizæ	3ias
t.d.s.p.c.		Spt. Amm. Aromat.	m 15
		Tl. Cardam. Co.	m 15
		Aqua Chloroformi ad.	3j
		t.d.s.	

Inhalations

R Terebini	3j	R Olei Eucalypti	m 20
Mag. Carb. Lævis	3ss	Olei Pini Sylvestris	m 20
Aqua. Dest. ad.	3j	Tl. Benzoin Co.	m 20

A teaspoonful of either of the above to be added to a pint of water at 140° F. and the vapour inhaled for ten minutes.

INSOMNIA.—This usually disappears under general treatment. Strychnine is said to be one of the best hypnotics in this condition. Alcohol in the form of brandy or whisky is useful. Opium is best avoided as while they may produce sleep they are eliminated with difficulty and are cumulative, if given the best form is Pulv. Ipecac. Co. If the sleeplessness is due to cough one of the following Lincti should be given:—

R Syrup Apomorph. Hyd.	3j	R Heroin Hydrochlor. gr. 1/24 to 1/12	
Syrup Picis Liq.	3ss	Syrup Pruni Virg.	m 20
Syrup Papay Alb.	3ss	Terpin Hydrate	gr. 1
Syrup Pruni Virg.	3j	Glycerine	m 20
Mist. Amygdalæ ad.	3ss	Sp. Vini Rect.	m 20

A tablespoonful when the cough is troublesome.

A teaspoonful occasionally.

CARDIAC FAILURE.—This is the most frequent and dangerous complication, œdema and congestion of the lungs being added to the bronchitis. For treatment see Heart Failure.

BRONCHO-PNEUMONIA

While this form of pneumonia may occur as a primary condition due to the pneumococcus, and is then generally in children under two years. It also occurs as a complication of infectious conditions such as measles, influenza and whooping-cough, as an extension of acute bronchitis and as a terminal state in

many diseases. A very serious type is septic broncho-pneumonia due to inhalation of septic liquid or foreign bodies.

TREATMENT—is similar in that of acute bronchitis, the patient should be kept in bed in a well-ventilated room with a constant temperature of 65° F., the air may be moistened with steam, but tents should be avoided. A light pneumonia jacket should be worn and stimulating diet, semi-solid or fluid given.

The following mixture is useful at the outset :—

R Liq. Amm. Acet.	5j	R Amm. Carb.	gr. 5
Pot Cit.	gr. 12	Vinum Ipecac	m 15
Syrup Tolu.	ʒss	Syrup Tolu.	ʒss
Mist. Amygdalæ	5j	Mist. Ammoniaci	ʒj
Aqua Camphoræ ad.	ʒj	Aqua Anisi ad.	ʒj
Every 4 hours.		Every 4 hours.	

Pain should be relieved by local applications of antiphlogistine, thermogen wool or Belladonna liniment. In severe cases Oxygen should be given before the onset of intense cyanosis. Vomiting should be treated with fractional doses of Calomel. Sudden collapse with injections of pituitrin or adrenalin. Mixed vaccines and chemical compounds, such as Nuclein and S.U.P. 36, have been used with a varying degree of success.

BRONCHO-PNEUMONIA IN INFANTS

The child must have abundance of fresh air, and kept quiet by careful nursing to avoid exhaustion; cold compresses should be applied to the chest. If there is much co-existing bronchitis, carry out the treatment for acute bronchitis, otherwise avoid expectorants and give Strychnine:—

R Liq. Strychnine Hyd.	...	...	m 1
Sp. Chloroformi	...	...	m 7
Aquam ad.	...	...	ʒj

In water four times daily.

BRUISES

In cases of extensive discolouration of the skin, if Olive Oil be freely applied without rubbing, the discolouration will quickly disappear, especially if the oil is applied warm. Absorbent Cotton may be soaked in the oil; if the skin is broken, Boric Acid should be applied over the abrasion.

R Tr. Opn	ʒj	R Spt. Camphor	ʒj
Liq. Plumbi Subacetatis	ʒj	Tr. Anicæ	ʒj
Aquæ Destillata ad.	ʒxvj	Sol. Hamamelidis ad.	ʒxvj
Applied freely on lint.		Applied on lint, or with gentle friction.	
Must not be used if the skin is broken.		Massage will hasten absorption.	

BUBO

Bubo should be treated by applications of Ichthyol or Tr. Iodi, with a spica bandage, and rest. X-rays have been recommended. A rapid absorption and cure is said to be usually obtained from the following:—

R Ung. Hydrarg.	...	...	...	5ij
Ung. Belladonna	...	...	...	3ij
Ichthyolis	...	...	...	3ij
Lanolini	...	...	...	5ij

Apply on lint every other day, cover with oiled silk, a large pad, and fix with a spica bandage.

If an abscess forms, aspirate the contents through a fairly stout needle introduced through the healthy skin if possible, at the external pole of the swelling. The aspiration may be supplemented by injecting a few c.c. of colloidal silver, it may have to be repeated two or three times as the cavity refills. If the skin is on the point of breaking make a very small incision across the lower and internal pole, with a small wick of gauze as a drain.

BUNION

In the first place an endeavour should be made to cure the condition by suitable shoes. Operative treatment by excising the bursa and the inner quarter or so of the metatarsal head will give relief.

BURNS AND SCALDS

Treatment must be considered under General and Local.

The constitutional effects of burning are those which are the dominant consideration at first, these effects occur in three successive stages—primary shock, primary toxæmia or secondary shock, and secondary or septic toxæmia.

The patient should be kept very warm and quiet. It is often a good plan to immerse the patient in a bath which is kept at an even temperature of 98°. This combats shock, soothes the patient and enables the charred clothes to be removed without pain. It is most important to give fluids in large quantities by mouth, rectum, subcutaneously or intravenously. If there is much vomiting, give R Sod. Bicarb. gr. 15 Aquam ad. ʒij every hour for the first six hours. Glucose is useful in children.

If the pain is very severe morphia may be given, but it is better avoided in children.

LOCAL TREATMENT.—Of the large number of treatments available Tannic Acid is the most satisfactory. It acts by coagu-

lating the burnt tissues and thus prevents the absorption into the general circulation of those toxins which are so fatal. The tannic acid should be a freshly prepared 2½ per cent. water solution, sprayed on from an ordinary atomizing spray every hour until the burnt area has attained a deep brown colour; this is usually obtained in 10 or 12 applications. If the burn is on the face the eyes must be protected with vasoline on the lids and wool pads otherwise the cornea may be seriously damaged.

The area is left exposed to the air and when the coagulum is fully developed it is a hard black plate with well-defined edges, which must be left to separate by itself when the following ointment should be applied:—

R Zinc Oxide	...	...	...	gr. 45
Eucalyptus Oil	...	...	...	m 15
Lard	...	...	...	3ij
Soft yellow Paraffin ad.	..	...	...	3l

If there is much sepsis use Boric fomentations.

Contractions must be prevented by movements and splints.

ALTERNATIVE TREATMENTS ARE.—The covering of the burn with an artificial shell of gauze and wax. Picric Acid is a useful dressing. It relieves pain and promotes the growth of epithelium but may cause poisoning. It is prepared by dissolving Picric Acid 1½ drachms in 3 ozs. of alcohol and adding a pint of distilled water, the solution being applied on gauze or lint.

BURNS, ELECTRIC

The injury to the tissues is concentrated to the immediate surroundings of the entrance and exit of the current, but if the limbs are flexed, burns are frequent at the flexures, the current being 'shorted' from one surface to another. The skin usually comes off as a complete layer leaving the deeper tissues in a state of coagulation necrosis dry, and the toxic phenomena seen with ordinary burns are absent. Treatment is on general principles.

BURNS BY ACIDS AND CAUSTICS

There is very little shock from these injuries.

TREATMENT—consists in neutralizing the acid if possible, and treating the areas by one of the methods used for ordinary burns. Carbolic Acid has a special danger as it may be followed by Carboluria and nephritis. The carbolic should

be washed off with spirit and then treated in the same way as for ordinary burns.

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BURSÆ, AFFECTIONS OF

Bursæ may be acutely inflamed from injury or sepsis, or chronically inflamed from trauma, tubercle or syphilis. If recent the condition may be treated by rest, removal of the cause of irritation, the application of Iodine or a blister, but if of any standing complete removal of the sac is the best treatment, but this may not always be an easy matter especially in some of the deeper bursæ.

CÆSARIAN SECTION—*See* Obstetrics.

CANCER, INOPERABLE

Apart from treatment with Radium and X-rays, much can be done by proper care not only to lessen the pain and distress, but even to prolong life.

GENERAL TREATMENT.—The diet should be an ordinary mixed diet with high vitamin content. Alcohol should not be withheld and will help to relieve pain and procure sleep. Tobacco except in the case of growths of the lips, mouth and throat should be allowed, but tea and coffee should be limited if there is much pain.

Constipation increases the restlessness and pain so that the bowels should be kept regular. As long as the patient can move about he should be kept as much as possible in the open air with direct sunshine, when confined to bed he should be carefully nursed in a cheerful room. In most cases as the disease advances, there is some anæmia and digestive disturbance for which one of the following tonics should be prescribed, but Strychnine should not be given as it increases the sensibility to pain.

R Ferri et Amm. Cit.	gr. 7	or R Liq. Arsenici Hydro.	m 4
Sod. Bicarb.	gr. 10	Acid Hydrochlor. Dil.	m 12
Liq. Arsenicalis	m 4	Tr. Cinchonæ Co.	m 25
Sp. Chloroform	m 5	Aquam ad.	℥i
Inf. Calumbæ ad.	℥j	t.d.s.p.c.	
t.d.s.p.c.			

RELIEF OF PAIN.—Pain varies considerably in different cases—in some the whole course is run with little or none, in others there is almost continuous agony. Every endeavour must be made to relieve this. If there is an ulcerated surface with exposed nerve endings, keep as clean as possible with antiseptic lotions. Cocaine is of little use, the effect passing off too soon. Orthoform in fine powder, phenol, guaiacol and subacetate of lead kept constantly applied as paints or lotions are more effective.

INTERNALLY.—Aspirin in 10 gr. doses will be effective at first, later Phenacetin is most useful, and is the least toxic of the analgesic drugs, but Amido-pyrim and Acetanilide may be tried. Sooner or later Opium will be required and is best given by the mouth, the action being greater and more prolonged, while Morphine is reserved for emergencies. Liquor Opii Sedativus causes less digestive disturbance than Tr. Opii; as the case advances very large doses may be required. Alcohol is a valuable anodyne.

A symptom, which causes much distress when swallowing is painful or difficult, is excessive secretion of saliva. This can be checked by Tr. Belladonna but it must be pushed in doses of 20 to 30 m.

HÆMORRHAGE.—Adrenalin is useless, as the vessels are thin walled without muscular coats. Try absolute rest with hot douches containing a styptic. If the bleeding point can be seen powdered dry Ferri Sulph. should be gently applied. Radium is a good preventive especially in cancer of the uterus and rectum.

REST.—The patient should have mental and physical rest, avoiding fatigue, and keeping the diseased part at rest as far as possible.

PALLIATIVE OPERATIONS.—It may be necessary to divide the nerves on the proximal side of a growth causing unbearable pain; colostomy in rectal carcinoma is most satisfactory, but tracheotomy in the late stage of laryngeal cancer gives little relief.

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CALCULUS, RENAL

Calculi in the kidney vary from fine gravel to large masses destroying the renal tissue. A case of gravel may be due either to an alkaline or acid diathesis, with Phosphaturia in the former and uric acid or oxalates in the latter. Even when no calculi are present, these conditions may give rise to all the symptoms of renal stone, i.e. hæmaturia, lumbar pain and even renal colic. Phosphaturia which usually depends on over-work and worry, should be treated by rest and a change of scene, with physical exercise, a full nourishing diet and a combination of mineral acids, bitters and hexamine will at once clear the urine as in the following mixture:—

R Sodii Phosph. Acid	...	...	gr. 25
Acid Nitro-Hydrochlor. Dil.	...	...	m 12
Hexamine	...	...	gr. 12
Inf. Gentian Co. ad.	...	...	3j
t.d.s.p.c.			

With large quantities of water or mineral waters, Vichy being particularly suitable.

If uric acid calculi or gravel have been passed alkalies are indicated as:—

R Acid Citric	...	...	gr. 50
Pot. Bicarb.	...	...	gr. 80
Aqua Destillata ad.	...	...	3j
Every 4 hours.			

Small calculi may sometimes be expelled by giving Tr. Belladonna 10 m every four hours for three or four days, together with large quantities of water 5 or 6 pints in the 24 hours. Glycerine has also been advised in amounts up to 100 c.c. daily. See also Gravel.

OPERATIVE TREATMENT.—In a small percentage of cases a stone may be fixed in the cortex, with no symptoms and normal urine. Operation should be advised when there is persistent pain, recurrent attacks of hæmaturia, or colic, and the

urine is infected. A calculus tends gradually to destroy the kidney. In half the cases of advanced calculus disease in one kidney, calculi will be found in the other.

URETERIC CALCULUS.—Renal Colic is caused by a calculus entering the ureter. The sudden agonizing pain will require Morphia Tart. $\frac{1}{4}$ to $\frac{1}{8}$ gr. with Atropine 1/100 gr. The spasm may be lessened by:—

R Tr. Belladonna	...	...	...	m 12
Pot. Cit.	...	...	...	gr. 25
Aquam ad.	...	...	...	3j

Every four hours until the pupils are well dilated.

Recently cases have been treated with 20 c.c. of Calcium Chloride 5% solution given intravenously.

If the stone is small and not expelled into the bladder with this treatment, milk, cheese, sugar and alcohol should be excluded from the diet and large quantities of water given daily, but if after six weeks the stone is unaltered in position operative treatment for its removal should be carried out.

FOR CALCULUS ANURIA.—If the patient's condition is satisfactory, operation by nephrotomy or ureterolithotomy should be immediately undertaken as the mortality rapidly increases with delay.

VESICAL CALCULUS.—Whenever possible the bladder should always be examined with the cystoscope before operating. A small calculus may at times be removed by the cannula and aspirator. All other stones should be removed by litholapaxy or lithotripsy with the exception of the following contra-indications:— (1) Severe cystitis. (2) Much sacculation. (3) Enlarged prostate. (4) New growths. (5) Very large and hard stones. (6) Renal insufficiency. Under these circumstances suprapubic lithotomy should be performed and the complication dealt with, such as bladder drainage for the cystitis, prostatectomy for the enlarged prostate, etc.

Litholapaxy is much more difficult in young children and must be performed with the greatest care and gentleness, but in skilled hands is more successful than lithotomy. It can be performed if a No. 6 catheter can be passed and the lithotrite can grasp the stone. If not, suprapubic lithotomy should be performed, lateral perineal lithotomy has been abandoned. In the female litholapaxy is an easy operation as the urethra is easily dilated to a considerable degree.

CARBUNCLE

The treatment is general and local.

GENERAL.—First ascertain if the patient is suffering from diabetes. If so, the appropriate treatment for that condition with insulin and diet must be at once commenced. The diet apart from diabetes should be nourishing and stimulating, easily digestible with stimulants and tonics. The following mixture has been advised:—

R Tr. Poti Perchlor.	m 10	or R Acid Sulph. Dil.	m 20 to 30
Pot. Chlor.	gr. 10	Aquam ad.	℥ij
Liq. Amm. Acet.	℥j	Every 4 hours.	
Syrup	3ss		
Aquam ad.	℥j		
Every 4 hours.			

The spread of the infection should be checked by a Staphylococcus vaccine, the first dose being 500 Million, and if possible this should be an autogenous vaccine. If a vaccine is not available Colloidal Manganese may be tried.

LOCAL TREATMENT is (a) Palliative with wet dressings of 1 in 2,000 Hydrarg. Perchlor. made with normal saline or (b) Radical by (1) Crucial incision which relieves pain and tension and allows the pus to escape, but does not check the sepsis, and the dead tissue will take a long time to separate. (2) Long incisions combined with the free use of the sharp spoon to remove the sloughs, the cavity being packed with gauze wrung out of Hydrarg. Perchlor. 1 in 2,000, together with rubber drains. Peroxide of Hydrogen or Eusol will help to detach the sloughs, but as in the case of simple crucial incisions infection may spread. (3) Excision—the whole necrosed area being excised by wide incisions carried down to the deep fascia. If there is no general constitutional state contra-indicating, this unquestionably is the best treatment. The wound is packed with gauze soaked in Hydrarg. Perchlor. 1 in 2,000 and allowed to heal by granulation. If the operation is done early, the skin may possibly be undercut and flaps will greatly diminish the healing period, otherwise skin grafting may be employed to cover clean granulations.

CARDIAC DISEASE

The important point to remember about a heart is its capacity as a pump; so long as this duty is efficiently performed, the bruits that it makes in carrying out its work can be disregarded. As with any pump the heart may fail in one of three ways:—

- (a) By failure of the supply of blood;
- (b) By failure of the nervous mechanism which gives it
* rhythmical action; or
- (c) By failure of its strength—the heart muscle.

The first condition is seen in shock and in many toxic and infective conditions, in which there is a diminished return of blood to the heart.

The second condition is due to abnormal rhythms, these are divided into two groups: (1) Functional without appreciable organic change in the heart and include tachycardia, bradycardia, palpitation in which the rhythm is normal but the heart is unduly fast or slow, sinus arrhythmia in which the rhythm is normal but an extra beat is interposed and varies with respiration, and in young people extra-systoles which are premature contractions. (2) Organic. This group includes those organic changes of the heart muscle whereby its excitability, conductivity or contractability are considerably altered. These conditions are heart block and Pulsus Alternans, in both the rhythm is normal, in the former there is depression of the conductivity, which may be either transient as is seen in acute specific fevers such as typhoid, rheumatism, diphtheria or permanent as in inflammatory, syphilitic or other degenerative diseases of the myocardium. In Pulsus Alternans there is a loss of contractile power and a small beat follows a normal beat in regular sequence, and is an indication of extreme exhaustion of the heart muscle.

The other conditions are paroxysmal tachycardia, auricular flutter and fibrillation. In the former while the rhythm is regular the pulse rate rises to 160 to 200 or even more per minute. In auricular flutter contractions occur at the rate of about 300 per minute, while in fibrillation they average 450. Both may be paroxysmal or permanent and are evidence of myocardial disease, and may occur with or without valvular disease. Auricular Fibrillation can be diagnosed apart from the electrocardiogram by complete irregularity of the pulse, and its importance lies in the fact that is very often the cause of cardiac failure. As regards treatment of these various conditions Simple Tachycardia or palpitation may be purely nervous and drugs are of little value, but anemia and gastro-intestinal disorders should be treated; there is a type of case due to a septic focus, tonsillar, oral, etc. which can only be cured by treatment or removal of the focus. Bradycardia may be physiological, there are persons, especially males, with a pulse rate of 50 or even 40 in perfect health. It is characteristic with some men who have led a very athletic life. A slow pulse may follow specific infective conditions such as influenza, toxic states especially jaundice, and injuries and tumours of the brain.

Sinus Arrhythmia is common in nervous children and on recovery from illness and does not require treatment.

Paroxysmal Tachycardia.—There is no treatment that can be said definitely to prevent or stop these attacks, patients

themselves frequently discover by experience what brings on or stops the paroxysms. Bromides are useless. Digitalis has succeeded in a few cases.

Heart Block.—In the minor degrees of partial heart block no treatment is required beyond that for the chronic underlying myocardial disease. In the complete form the pulse is permanently slow, and there are periods of unconsciousness, petimal and epileptic convulsions (the Stokes Adams syndrome). The condition is very dangerous and sudden death may occur. The best treatment is Adrenalin Hydrochlor. (1 in 1,000) 5 m every four hours with Barium Chloride gr. $\frac{1}{2}$ twice daily. Digitalis is strongly contra-indicated.

Treatment of Auricular fibrillation and flutter to be effective must either restore normal rhythm, or shield the ventricle from over-frequent auricular stimuli, and resolves itself into a consideration of Digitalis versus Quinidine. Digitalis both increases the contractile power and diminishes the excitability of the cardiac muscle, at the same time decreasing the conductivity of the auriculo-ventricular bundle. While Quinidine tends to restore the normal rhythm, it has unfortunately toxic properties and is seldom effective except in large doses, and is then dangerous unless controlled by electrocardiograms or expert supervision, which rules it out of consideration for the general practitioner. Digitalis should be used when there is cardiac failure, an enlarged heart with valvular lesion or recent embolism. It certainly increases the myocardial efficiency.

CARDIAC FAILURE occurs in three main types:—(1) Congestive. (2) Anginal. (3) Paroxysmal dyspnoea, cardiac asthma and acute pulmonary oedema. While No. 3 can be associated with either No. 1 or No. 2, Congestive and Anginal failures are usually distinct, all forms may be either acute or chronic.

CONGESTIVE FAILURE.—The most important signs of this condition are:—(1) Othopnoea with congestion of the lung bases, (2) Oedema of the legs, (3) Enlargement of the liver, and (4) Albuminuria. The treatment of congestive failure is summed up in two words: Rest and Digitalis. There is probably no more dramatic and efficient treatment in the whole of medicine than the proper administration of Digitalis in these cases by an active form of the drug in sufficient doses. The two principal methods of dosage are:—Massive doses where the amount is given in 24 or 48 hours and smaller doses where the treatment is spread over a week. Massive doses of Digitalis should only be given if the patient's condition is critical and is only likely to live a short time unless treated in this way. The dose is calculated as follows:—

$2\frac{1}{2} \times \text{Body weight in lbs.} = \text{Dose in Minims.}$ Thus for a patient 10 Stone = 140 lbs. $\times 2\frac{1}{2} = 350$ m Digitalis.

						Total.
I	...	3ij	3jss	m 45	m 45	3vi
II	...	3ij	3j	m 30	m 30	3iv
III	...	m 30	m 30	m 30	m 30	3ij
IV	...		m 20	m 20	m 20	

The smaller doses are given if the patient's condition is not so serious.

Three other methods of treatment are useful in appropriate cases.

Oxygen.—If there are pulmonary complications, such as acute pulmonary oedema and cardiac asthma, it will then be helpful.

Venesection is valuable in acute heart failure when rest has not greatly reduced the venous engorgement, and in robust patients with an unusually high diastolic pressure.

Diuretics.—If rest and Digitalis have not removed the oedema then Diuretin 20 gr., Theobromine 10 gr., Theocoin 4 gr. each t.d.s. may be given.

ANGINAL FAILURE—*See* treatment for Angina Pectoris, page 19.

CORONARY THROMBOSIS.—This must be referred to separately as it is most important both from the point of view of prognosis and treatment to diagnose between coronary thrombosis and ordinary angina. Briefly the typical case of Coronary Thrombosis is anginal pain, but much more prolonged and lasting, the patient being restless and not still as in angina, associated with the pain is marked collapse and shock with a rapid feeble pulse, and not a pulse that remains normal as in angina. There is frequently vomiting.

The treatment is rest in bed for a long period and morphia.

FAILURE WITH DYSPNŒA, CARDIAC ASTHMA AND ACUTE PULMONARY ŒDEMA.—While dyspnœa may be due to many causes it is generally an important sign of heart failure.

CARDIAC ASTHMA—occurs in cases with aortic disease and atheroma, also when the left ventricle is hypertrophied especially with high blood pressure and renal disease. Treatment: Give morphia immediately and oxygen as soon as possible.

ACUTE PULMONARY ŒDEMA—occurs in similar organic lesions of the heart. The symptoms then generally come on during the night and quite suddenly the patient is seized with a feeling of suffocation. He is cyanosed, struggles for breath

with quantities of frothy sputum. On examination of the chest, it is found full of moist rales. Treatment which gives immediate relief is a full dose of morphia and atropine.

FAILURE OF THE STRENGTH OF THE HEART MUSCLE—from fatty infiltration, fatty degeneration and fibroid myocarditis. For this condition little can be done unless the case is seen at an early stage, then the patient's life should be regulated with avoidance of over-exertion, physical and mental, and sudden exertion. Exercise in the open air, attending to the digestion by regulation of meals, etc.

COMPENSATION.—The ability of the heart muscle to neutralize the results of valvular defects and its own structural changes and to carry on the circulation is remarkable. Recently a patient was under treatment for another condition, who for 40 years had a severe mitral lesion, but the compensation was so good that for all this time she had no trouble or evidence of failure and had six pregnancies.

PRESSCRIPTIONS

Stimulants

R Caffein	gr. 20	R Strophanthin	gr. 1/500
Sod. Salicylate	gr. 17½	with 10 c.c. Saline, direct	
Distilled Water	ʒi	into a vein, in severe	
12 m hypodermically every 4 hours,		cardiac collapse.	
in severe collapse.			

Burney Yeo recommends the following for children, eight to twelve years old:—

R Spt. Ætheris Co.	...	...	m 10
Tr. Nux Vom.	...	...	m 5
Tr. Lavandulæ Co.	...	...	m 5
Aqua Carui ad.	...	...	ʒss

Every 4 hours.

Nervous Palpitation

R Tr. Aconite	m 1
Tr. Digitalis	m 2
Tr. Belladonna	m 2
Inf. Gent. Co. ad.	ʒss

Every 4 hours.

Palpitation and Heart Pain

R Tr. Belladonna	m 5
Tr. Camph. Co.	m 15
Syrup Aurantii	ʒss
Aqua Camph. ad.	ʒi

Every 4 hours.

Dyspeptic Palpitation

R Tr. Strophanthus	m 2	R Sod. Bicarb.	gr. 10
Caffein Cit.	gr. 8	Amn. Bromide	gr. 12
Liq. Starchnine Hyd.	m 8	Tr. Rhei Co.	m 6
Aqua Chloroformi ad.	ʒss	Aqua Menth. Pip. ad.	ʒss

In water every 4 hours.

In water before meals.

<i>Cardiac Dropsy</i>		<i>Cardiac Tonic</i>	
R Pulv. Digitalis	gr. 1	R Tr. Digitalis	m 5
Pulv. Scilla	gr. 1	Liq. Trinitum	m 1
Pd. Hydrarg.	gr. 1	Tr. Strophanthus	m 3
Ext. Hyoseyamus	gr. 2	Caffein Hydrobrom.	gr. 1
One pill twice daily.		Sp. Armoracæ Co. ad.	5j
		A teaspoonful in half a wine-glass of water t.d.s.	

Prescriptions for giving Digitalis:—

R Tr. Digitalis	m 2	R Tr. Digitalis	m 7
Caffeine Cit.	gr. 2	Caffeine	gr. 2
Tr. Nux Vom.	m 2	Tr. Nux Vom.	m 7
Aquam ad.	3ss	Sod. Salicylate	gr. 5
Every 4 hours.		Syrup Amant.	3j
		Aquam ad.	3j
		t.d.s.	

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CARCINOMA—See Cancer.

CARIES, DENTAL—See special article on Dental Surgery.

CARIES OF THE SPINE—See Spine, Caries of.

CATARACT—See Diseases of the Eye.

CATARRH, ACUTE NASAL

The Common Cold. Repeated attacks cause permanent changes in the nasal mucous membrane which render it still more prone to attacks. The causes are:—

1. INTRA-NASAL.—Deformity of the septum, large middle turbinated bones causing obstruction to ventilation and drainage with resulting lower resistance.

2. EXTRA-NASAL.—Defective hygiene, overclothing, bad ventilation, excessive smoking and adenoids. Constitutional—faulty metabolism, gout, rheumatism, diabetes.
3. MICROBIC.—The organisms commonly causing the trouble are Friedlander's Bacillus, B. Influenza, B. Septus, Micrococcus Catarrhalis and the Pneumococcus.

TREATMENT.—Remedy any of the above causes. My experience is that nearly all colds can be aborted if the nose is repeatedly and thoroughly irrigated with the following warm solution:—

R Sod. Chloridi	...	...	...	gr. 7
Boracis	...	...	...	gr. 2½
Acid Borici	...	...	...	gr. ½
Sodin Benzoatis	...	...	...	gr. ½
Menthol	...	...	...	gr. 1/50
Thymol	...	...	...	gr. 1/100
Belacainæ Hydrochlor.	...	...	...	gr. ½
Oleum Gaultheriæ	...	...	...	m 1/20

One tabloid powdered and dissolved in 1½ or 2 ozs. of warm water. These tablets are manufactured by Messrs. Boot's Chemists, Nottingham. The old-fashioned remedy of a very hot bath with Pulv. Doveri 5 to 15 gr. and a hot drink on going to bed is effective in many cases, either with or without a dose of Calomel followed by a Saline in the morning.

VACCINE THERAPY.—Unless the local and general conditions mentioned above are dealt with vaccines will prove ineffective. A polyvalent stock vaccine is generally more suitable than an autogenous as the cold may be produced by one organism in one attack and by different organisms in the next. It is important to note that from the second day vaccines should be used with great caution and never in large doses.

The following prescriptions have proved useful in:—

Nasal Catarrh

R Spt. Ætheris Nil,	ʒss	R Sol. Adrenalin, 1 in 1000	m 10
Tr. Camph. Co.	ʒss	Sol. Cocaine, 1 per cent.	ʒv
Liq. Amm. Acet.	ʒj	Cherry Laurel Water	ʒv
Syrup Tolu.	ʒss	A few drops to be sniffed	
Aqua Anisi ad.	ʒj	up the nostrils 3 or 4	
t.d.s.		times daily.	
R Liq. Amm. Acet.	ʒij	R Terebene	ʒj
Tr. Aconite	m 3	Ol. Eucalypti	ʒj
Vin. Ipecac	m 5	Camphor	ʒj
Aqua Chloroformi ad.	ʒj	Menthol	ʒj
At bed-time.		To be sprinkled on the handkerchief and inhaled.	

R Sodium Salicylate	gr. 10	R Spt. Ether Nit.	3j
Spt. Amm. Aromat.	3ss	Vin. Ipecac	℥ 5
Tr. Belladonna	℥ 5	Liq. Amm. Acet.	3ii
Aqua Chloroformi ad.	3j	Tr. Opn	℥ 10
Every 4 hours.		Aqua Camph. ad.	3ss
		Take at night and every	
		1 hour in the day.	

Nasal Drops or Oil Spray

R Chlorotone	gr. 5	R Menthol Crystals	gr. 2 to 10
Camphor	gr. 10	Camphor Gum	gr. 2 to 10
Menthol	gr. 10	Bland Petroleum Oil	3j
Oil Cinnamon	℥ 2		
Refined Liq. Petroleum	3j		

Ringer has strongly recommended Pot. Iodide for cutting short a cold.

CATARRHAL JAUNDICE—*See* Jaundice, Catarrhal.

CELLULITIS—*See* Erysipelas.

CEREBRAL ABSCESS—*See* Abscess.

CEREBRAL HÆMORRHAGE—*See* Apoplexy.

CEREBRAL TUMOURS—*See* Brain, Tumours of.

CEREBROSPINAL MENINGITIS

General management and nursing requires special care and attention, as these cases are very apt to develop bed-sores. Bowels must be kept well opened. All discharges from the nose must be wiped away and burnt. Salines with Glucose are of special benefit. The specific treatment consists of lumbar puncture and anti-sera. Even simple lumbar puncture has been followed by cure, and this simple operation enables the infecting type of organism to be identified. As regards the antimeningococcal serum, Flexner's should be given if available, if not a polyvalent serum 20 to 50 c.c. being given intramuscularly or intravenously. At the same time a dose of serum equal to 10 c.c. less than the amount of cerebrospinal fluid withdrawn is given intrathecally, at first twice daily then once a day. Early treatment with serum is absolutely imperative. This treatment may be helped by 50 to 100 M. of an autogenous vaccine, derived from a blood culture or cerebrospinal fluid. The most serious complication is hydrocephalus. In the carrier stage all unhealthy foci in the throat and nose must be treated and an autogenous vaccine given.

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CERVICAL RIB

Care must be taken that the symptoms are not due to syringomyelia. Seventy per cent. of these cases are merely nervous usually in women and on the right side. Treatment consists in removing the supernumerary rib and its periosteum or division of the scalenus anticus muscle.

CERUMEN, INSPISSATED—*See* Diseases of the Ear.

CHALAZION—*See* Diseases of the Eye.

CHEMOSIS—*See* Diseases of the Eye.

CHANCROID (SOFT SORE OR SOFT CHANCRE)—*See* Modern Treatment of Venereal Diseases.

CHICKEN-POX

The important point is to prevent the lesions becoming septic, and with this object and to allay the irritation a boracic acid bath is given daily (1. oz. to the Gallon) and the child's hands put in gloves. Should lesions become septic treat with Boric Acid fomentations.

CHLORISIS—*See* Anæmia.

CHOLECYSTITIS

In the acute condition hot fomentations should be applied to the hypochondrium. Plenty of soda-water with Sod. Bicarbonate given to drink. The best drug is Sodium Salicylate in small doses with Calomel and Salines for the bowels.

In the chronic condition diet is of importance. Yolk of egg in all forms must be strictly avoided, and cream, butter

and fats strictly limited. Plenty of green vegetables, non-acid fruit and brown bread should be taken, and this dietary must be always followed. Moderate exercise and breathing exercises should be taken every morning. No corsets should be worn and nothing to constrict the waist.

The following mixture should be taken:—

℞ Hexamine	gr. 100	℞ Mag. Sulph.	ʒj to ʒij
Sod. Bicarb.	gr. 60		Every other morning.
Pot. Cit.	gr. 60		
Aqua Menth. Pip. ad.	ʒij	℞ Olive Oil	ʒss
To be taken after breakfast, after		Half an hour before lunch and	
tea and after a glass of water		dinner.	
or milk, the last thing at			
night.		(Hurst.)	

The above treatment is carried out for a month, then after a fortnight's interval for another month, subsequently for an occasional ten days or for longer periods if symptoms threaten.

OPERATIVE TREATMENT.—If tenderness with fever persists the gall-bladder should be drained, but excision is never necessary as a life saving measure. In chronic cases when the abdomen is opened the stomach, duodenum and appendix must be most carefully examined. If the gall-bladder is definitely diseased cholecystectomy should be performed.

CHOLERA

TREATMENT BY ROGERS' METHOD

Revised by Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

May, 1934.

(1) Give as much CALCIUM PERMANGANATE WATER, strength 1 to 6 gr. to the pint, as the patient can drink. Kaolin, one part in three parts of water, may also be given freely to drink, as it absorbs cholera toxins and lessens their absorption from the bowel.

(2) Give POT. PERMANGANATE finely powdered 2 gr. and mixed with Kaolin and then coated with Keratine or Sandarach varnish, which ensures slowly dissolved permanganate without cauterizing effect on the mucous membrane.

Suitable keratin coated permanganate pills are made by Park Davis Co.:—

(a) One to two pills every quarter of an hour for 2 hours.

(b) Then one pill every half-hour.

- (c) Any pill vomited is immediately replaced.
- (d) These pills are continued, until the stools become green, and less copious, which may occur in 12 to 24 hours.
- (e) At the beginning of the second 24 hours, 8 pills are given in 4 hours.
- (f) In severe cases, this is repeated at the beginning of the third 24 hours.
- (g) In mild cases, after the first 24 hours, the pills are only given every 4 hours.

(3) **HYPERTONIC SALINE.**—The rule regarding the Specific Gravity of the blood and intravenous saline is that if the Sp. Gr. rises to 1063, 3 pints are given; if 1064, 4 pints are given; if 1065, 5 pints; whatever the blood pressure is. Restlessness, cramps, and cyanosis are also taken as indications. The glycerine and water solutions for testing the Specific Gravity can be made up with the help of an urinometer very simply.

In addition to the Hypertonic Saline with 120 gr. Sodium Chloride, and 4 gr. Calcium Chloride to a pint, an alkaline solution consisting of 160 gr. Sodium Bicarbonate, and 90 gr. Sodium Chloride is also used; give 1 pint of this and two to four pints of the Hypertonic Saline. The alkalinity of the blood is thus increased, and the post-choleraic uræmia mortality has been reduced by about two-thirds. The two solutions can be mixed in the same flask.

The temperature is judged by the rectal temperature as follows:—

Rectal temp. below 99°	Flask temp. about 102°F.
" " 99° or over	Flask temp. about 98°F.
" " over 100°	Solution should not be warmed to over 80°F.

Important.—The bladder must be carefully watched to avoid overdistension.

TREATMENT OF—

PERSISTENT VOMITING:—

(1) R Cocaine $\frac{1}{4}$ gr. in a teaspoonful of water.

(2) R Mist. Pepsini Co. et Bismuthi 10 m.

Every half-hour for 4 doses.

CRAMPS.—Massage, rubbing with Ginger, inhalation of a mixture of Chloroform and Oxygen.

DELIRIUM.—Bromides with Tr. Hyos.

PROSTRATION.—(a) Strychnine, with or without Atropine, if there are no severe cramps. Atropine gr. 1/120 morning and evening hypodermically lessens shock.

(b) Camphor in Ether hypodermically.

DIET.—No food whatever should be given during the acute stage; except that in young children and feeble adults, glucose solutions to drink, by the bowel or intravenously, lessen the tendency to cardiac failure. A beginning should be made very gradually with thin barley or rice water. Beware of excess of ice to suck. *See also Diet in Certain Diseases.*

CHORDEE

A painful condition due to thrombosis in either the corpus cavernosum or corpus spongiosum usually seen in severe gonorrhoea, but may occur in stricture, periurethral abscess, etc.

The following prescriptions should be tried:—

R Ext. Hyos.	gr. 3	R Pulv. Opi	gr. 1
Pulv. Camphoræ	gr. 2	Pulv. Camphoræ	gr. 3

The pill to be taken at bed-time.

R Codeinæ Phosphas.	...	...	gr. ½
Chloral Hydras.	...	...	gr. 10
Pot. Bromide	...	...	gr. 20
Aqua Menth. Pip. ad.	...	...	℥j

On going to bed repeat in 8 hours if necessary.

CHOREA

A spasmodic condition now considered due to an encephalitis from the virus of acute rheumatism, but is a condition tending to natural recovery. Treatment during the course of the disease, which varies from six weeks to six months, rest is most essential. Drugs are of little use in the general run of cases, Aspirin in 10 gr. doses t.d.s. for children over 8 years is one of the best. Arsenic was at one time the accepted remedy. Chloral and Bromides will allay some of the restlessness.

R Liq. Arsenicalis	m 3	R Chloral Hydras.	gr. 8
Sod. Bicarb.	gr. 7	Pot. Brom.	gr. 12
Sp. Chloroformi	m 7	Aqua Chloroformi ad.	℥ss
Aqua Dest. ad.	℥ss	Every 4 hours for a child of	
	t.d.s.p.c.	10 years.	

The Arsenic for children over ten is gradually increased up to 15 to 20 m. Antipyrin, Trional and Chlorotone have all been advocated. Sodium Luminal gr. ½ hypodermically is a powerful remedy.

As a measure of prophylaxis tonsillectomy has not proved to be effective. Recently a new treatment has been introduced; Nirvanol (urea and glycol) 0·3 grammes is given daily with the object of producing a definite reaction with rash and pyrexia, when this occurs the drug is stopped. It is said to be very successful, but its use is not without risk.

CHYLURIA—*See* Filariasis.

CIRCUMCISION

The complications of phimosis and for which the operation may have to be performed are:—

1. Retention of urine with backward pressure on the bladder, ureters and kidneys.
2. Difficulty in passing urine.
3. Retention of secretion with balanitis.
4. Masturbation from irritation or difficult coitus.
5. Hernia or prolapsus and resulting from straining.
6. Paraphimosis.
7. Malignant Disease.

In performing the operation it is important to remove a sufficiency of both layers of the prepuce, but sufficient should be left so that the corona glandis is covered when the wound is healed. In adults the operation can be done under local anaesthesia. It is important to remember that a pinhole meatus is frequently associated with phimosis and should be treated at the same time.

CIRRHOSIS OF THE LIVER

If the patient comes for treatment in the early stages when the symptoms are those of gastric catarrh and hepatic congestion, the best treatment is rest in bed with peptonized milk 3 or 4 pints daily for as long as the patient can tolerate it, three months if possible. Followed by a milk diet for another 3 to 6 months, if the patient will submit the result is remarkably good. Alcohol is of course absolutely prohibited in any form, and the patient should always avoid spiced or irritating food. Unfortunately the majority of patients come under treatment when the serious symptoms of hæmatemesis or ascites have developed. Hæmatemesis may be very profuse; it usually stops spontaneously, but may require Adrenalin 1 in 1,000 10 to 30 m in a drachm of iced water every 2 hours, or it may require Calcium Chloride 1 gr. in ʒij Water or Hæmoplastin 1 c.c. in-

travenously. Even after hæmatomesis I have known cases live for ten years and lead useful lives if there is a complete cessation of alcohol. As regards ascites if this is not due to simple, chronic or tubercular peritonitis the patient will not live longer than two to three months. (Edema of the foot is another grave event (Hale-White). Alcoholic Cirrhosis in patients under forty is accompanied by tuberculosis either of the lungs or peritoneum in two-thirds of the cases. The following prescriptions have proved useful in some cases:—

R Amm. Chloride	gr. 12	or R Oleum Copaiba	m 12
Liq. Ext. Taraxaci	ʒi	Mucilage Acacia	ʒi
Tr. Apocyanum	ʒss	Syrup Tolu.	ʒi
Syrup Auranti.	ʒss	Aqua Cinnam. ad.	ʒi
Inf. Sennæ Co. ad.	ʒi		
Twice daily.		R Pulv. Jalapæ Co.	gr. 15
Novasurol.—This is still on trial.		Pot. Tart. Acid	gr. 80
		For one powder.	

The Talma-Morison operation, by which an attempt is made to increase the collateral circulation between the portal and systemic venous systems, has been tried in some cases. But when the ascites is due to a general toxæmia, the result of failure of liver function, the condition is terminal for which no treatment is availing.

CLEFT PALATE—*See* books on General Surgery.

CLIMACTERIC—*See* Menopause.

CLIMATIC TREATMENT—*See* Hill Stations and Health Resorts.

CLUB FOOT—*See* Talipes.

COCAINE HABIT—*See* Drug Habit.

CÆLIAC DISEASE

This is a chronic intestinal disturbance in children over a year old, the motions are large, pale and offensive. There is wasting and arrest of growth. These children do not tolerate fat or carbohydrates. Diet is of the first importance and should consist largely of raw, fresh meat juice. A child of two years can take 6 ozs. daily. Vitamins are also very important. Vitamin A should be given in the form of Radiostol 5 mgrm. daily and Vitamin C as orange juice. Gelatin is recommended, Dextrins can be given as malted rusks or breakfast biscuits. Milk is not

easily digested. The child must be kept very warm and quiet. Drug treatment in general is unsatisfactory, but at times it is advisable to delay the passage of food through the intestine by giving Opium 1 m t.d.s. for every year of age with an astringent, such as Bismuth.

COLD IN THE HEAD—*See* Catarrh, Acute Nasal.

COLIC

BILIARY COLIC.—

- (1) Morphia Tartrate gr. $\frac{1}{4}$ with Atropine Sulphate gr. 1/100 and a hot bath.
- (2) Stop all food and give water only by mouth.
- (3) After six hours give Bismuth, Hydrocyanic Acid and Morphia mixture.
- (4) If there is much tympanites give a Turpentine Enema and Turpentine Stupes to the Epigastrium.
- (5) After the acute attack is over give:—

R Sod. Salicylate	...	...	...	gr. 8.
Ext. Belladonna	...	...	...	gr. $\frac{1}{8}$

Dissolved in hot water t.d.s.

But no drug can cure or remove gall-stones, the constant irritation from which often results in Carcinoma; operation should always be advised. The Mayo Brothers have published numerous statistics showing that gall-stones once removed do not recur.

COLIC IN CHILDREN

TREATMENT OF THE ATTACK.—Hot fomentations to the abdomen, or in severe cases, the mustard bath, and dill-water as a carminative. To prevent recurrence in bottle-fed babies, see that the bottles are clean and that the child is getting a suitable milk mixture. *See* Artificial Feeding of Children.

IF THE CHILD IS BREAST-FED.—It is probably getting too large a food and at irregular intervals. Nothing is so important as the absolutely regular feeding of infants. In both bottle- and breast-fed, treat constipation, if present, and give the following mixture between feeds:—

R Sodii. Bicarb.	...	...	...	gr. 2
Tr. Rhei. Co.	...	...	...	m 2 $\frac{1}{2}$
Sp. Amm. Aromat.	...	...	...	m 2
Aqua Anethi	...	...	...	3j

Flatulent Colic

R	Ol. Terebinthinæ	...	...	m	4
	Liq. Ext. Liquorice	...	...	m	10
	Spt. Ether. Nit.	...	...	m	20
	Codeine	...	...	gr.	$\frac{1}{4}$
.	Mist. Amygdalæ ad.	...	...	...	ʒij

t.d.s. for a child of 7 or 8 years.

INTESTINAL COLIC.—Apply hot bottles or hot turpentine stupes to the abdomen. In all severe cases it is safer to empty the bowel by an enema; this should be large 1 or 2 pints of soap and water to which is added $1\frac{1}{2}$ ozs. of Castor Oil or if there is much flatulent distension $\frac{1}{2}$ oz. of Oil of Turpentine.

A useful aperient draught for colic is:—

R	Oleum Ricini	...	...	...	ʒvi
	Tr. Rhei.	...	...	...	ʒij
	Tr. Opi.	...	...	m	10
	Aqua Menth. Pip ad.	...	...	...	ʒij

The pain may be so intense that a hypodermic of Morphia $\frac{1}{8}$ to $\frac{1}{4}$ gr. with Atropine 1/100 gr. may be necessary.

Belladonna is valuable in intestinal spasm especially of the colon and may be combined with a carminative mixture such as the following after the bowels have been open:—

R	Tr. Belladonna	...	...	...	ʒss
	Tr. Cardamoms Co.	...	...	...	ʒij
	Sp. Ammoniac Aromat.	...	...	...	ʒiss
	Sp. Chloroformi	...	...	...	ʒiss
	Sod. Bicarb.	...	...	...	ʒi
	Aquam ad.	...	...	...	ʒvi

An ounce every two hours.

Lead Colic.

R	Mag. Sulph.	ʒijj	R	Pulv. Opi	gr. 12
	Acid Sulph. Dil.	ʒj		Ext. Belladonna	gr. 2
	Aqua	ʒiv		Olei Tiglii	m 12
	One teaspoonful t.d.s.			Make 12 pills. One pill every	
	Precede by 10 gr. Pot. Iodide.			2 hours until relieved.	

The subcutaneous injection of a pint of saline, under the skin of the abdomen, has been of great benefit in some cases. See also Plumbism.

RENAL COLIC.—

- (1) If not severe, a hot bath gives great relief, and may be sufficient to relax the spasm; if not—
- (2) Morphia Tartrate gr. $\frac{1}{4}$, with Atropine Sulphate gr. 1/100, followed by—

- (3) Tr. Belladonna m 10 Aquain ad. ʒss every 8 hours.
- (4) The patient must be made to drink large quantities of barley water, lemonade or plain water.
- (5) Occasionally, change of posture or inversion will give great relief.
- (6) Inhalation of Chloroform may be necessary if the pain is very severe until the Morphia and Atropine have time to act.

COLITIS

This condition has to be considered under two heads—(1) Ulcerative Colitis and (2) Mucous or Muco-Membranous Colitis.

ULCERATIVE COLITIS—closely resembles bacillary dysentery, but occurs usually in sporadic form, and while the stools contain both blood and mucus, differs from acute bacillary dysentery in showing more faecal matter. Rest in bed and warmth are essential, the diet need not be so strict as in acute dysentery and in addition to citrated milk, Benger's food, condensed milk, eggs, custard, junket, ground rice, arrowroot, jellies and fruit juice may be given. Drugs are of little use and colon lavage is the most valuable form of treatment, with polyvalent antidyenteric serum intravenously daily for 7 to 10 days in doses of 50 to 100 c.c. (Hurst). If improvement does not take place the operation of appendicostomy followed by colon lavage or œcostomy should be performed.

MUCOUS COLITIS.—The characteristic of these cases is chronic constipation of the spastic type, with abdominal pain and the constant passage of excess of mucus in the stools.

Treatment should consist of a full mixed diet with plenty of butter and cream, the patient should lead as normal a life as possible with exercise in the open air. At the commencement of treatment the colon should be emptied by a warm enemata of Olive Oil 15 ozs. given slowly in the knee-elbow position. Constipation should be overcome by liquid paraffin or agar-agar jelly, but drastic purges must be most carefully avoided. If the colon is frequently irrigated, normal saline or Sod. Bicarb. (ʒj to 0j) should be used. The following prescription recommended by Locart Mummery is unquestionably of value:—

R Tr. Hyos.	...	...	...	ʒss
Tr. Belladonna	...	...	...	m 6
Sod. Bicarb.	...	...	...	gr. 20
Tr. Zingiberis	...	...	...	m 15
Sp. Chloroformi	...	...	...	m 20
Aqua Menth. Pip. ad.	...	...	...	ʒi
t.d.s.				

COMPOUND FRACTURES—*See* Fractures, Compound.**COLLAPSE AND FAINTING**

Inhalation of Ammonia or Amyl Nitrite capsules.

By mouth Sp. Ammonie Aromat. Alcohol. Digitalis. If due to hæmorrhage, give Strychnine 1/50 gr. hypodermically or Camphor; and Saline intravenously. In sudden collapse carry out artificial respiration until the patient has recovered.

COLON, CARCINOMA OF

If detected and operated on at an early stage the results are excellent as cancer of the pelvic colon is often of a very favourable character as regards its malignancy; invasion of the surrounding structures being slow, and there is no great tendency to recur. Therefore all patients with symptoms that might point to carcinoma of the colon should be carefully examined with X-rays and a Barium enema and the sigmoidoscope. Diverticulitis may closely simulate cancer.

COMA**CAUSES.—**

1. *Injuries to the Head.*

2. *Cerebral Lesions:—*

- | | |
|--------------------------|---|
| (1) Cerebral Hæmorrhage. | (5) Cerebral Abscess. |
| (2) Cerebral Embolism. | (6) Cerebral Syphilis. |
| (3) Cerebral Thrombosis. | (7) Meningitis. |
| (4) Cerebral Tumour. | (8) Thrombosis of the Cerebral Sinuses. |

3. *Other Lesions of the Nervous System:—*

- | | |
|--------------------------------------|-------------------------|
| (1) Epilepsy. | (3) Multiple Sclerosis. |
| (2) General Paralysis of the Insane. | |

4. *Toxic:—*

- | | |
|---------------|--|
| (1) Uræmia. | (3) Alcohol. |
| (2) Diabetes. | (4) Narcotic poisoning, such as Opium, Carbolic Acid, etc. |

5. *General Diseases:—*

- | | |
|---------------------------|------------------------------|
| (1) Pernicious Malaria. | (3) Ulcerative Endocarditis. |
| (2) Acute Yellow Atrophy. | (4) Typhoid. |

6. *Heat-stroke and Exposure to Extreme Cold.*

7. *From great Muscular Exertion.*

For treatment refer to each condition.

COMEDONES—*See Acne Vulgaris.*

COMPRESSION, CEREBRAL—*See Head Injuries.*

COMPOUND FRACTURES—*See Fractures.*

COMPOUND INJURIES OF JOINTS—*See Joints, Injuries of.*

CONCUSSION, CEREBRAL—*See Head Injuries.*

CONGENITAL DISLOCATION OF THE HIP

As a rule the condition is not suspected until the child begins to stand and walk. Up to six years in unilateral and five years in bilateral, treatment by manipulation may give excellent results. After this time it will be necessary for the muscles to be stretched before reduction, the limb being put up in Plaster of Paris.

CONGENITAL PYLORIC HYPERTROPHY

In considering whether the case is one for medical or surgical treatment, it should be remembered that the disease is self-limited and disappears about the end of the fourth month. Consideration must be given to the age of the child and the time of the onset of the vomiting. Surgical treatment has been much simplified by Ramstedt's operation by which the circular muscular fibres of the pylorus are divided longitudinally down to the mucous membrane, the obstruction being at once relieved.

CONGENITAL SYPHILIS

The treatment of infants is carried out on the same lines as for adults. The infant at birth is analogous to an untreated adult many months after infection, and its treatment should then continue for 2 years; but if the mother has been treated during pregnancy, one year's treatment is generally sufficient. Intravenous injections may be given of Neosalvarsan 914, or it may be given into the gluteal muscles; the commencing dose should be 0.05 gramme.

Mercury is best given by the mouth in the form of Hydrarg. cum Creta $\frac{1}{2}$ gr. night and morning, and gradually worked up

to gr. 3 daily, or it can be given, by inunction, in form of Ung. Hydrarg., rubbed into the abdomen once or twice daily.

Note.—It is important to remember that the sign of an overdose in infants is diarrhoea. Mercury never causes salivation as in the case of an adult.

CONGESTION AND ŒDEMA, PULMONARY—*See* Congestive Heart Failure and Pulmonary Œdema under Cardiac Disease.

CONJUNCTIVITIS

The important principles in the treatment of all forms of conjunctivitis are:—(1) To wash away the discharge and prevent it being pent up behind closed lids. (2) Carefully to watch the condition of the cornea. (3) Maintaining the patient's general resistance.

Mild Conjunctival Inflammations

To be used every three or four hours.

℞ Chlorotone	gr. 1	℞ Zinc Sulphate	gr. $\frac{1}{2}$
Boric Acid	gr. 3	Boric Acid	gr. 3
Distilled Water to	℥i	Adrenalin Chloride (1 : 1000)	m 10
		Distilled Water to	℥i
℞ Zinc Sulphate	gr. 1	℞ Sodium Borate	gr. 15
Alum	gr. $1\frac{1}{2}$	Boric Acid	gr. 15
Boric Acid	gr. 5	Sol. Hydrarg. Perchlor. (1 : 10,000) to	℥i
* Distilled Water to	℥i		

Acute Catarrhal Conjunctival Inflammation

℞ Nitrate of Silver	gr. 3	℞ Argylol	gr. 30 to 90
Distilled Water to	℥i	Distilled Water to	℥i
Dispense in coloured bottle.		To be used every three hours.	
To be used once or twice daily.			

Angular Conjunctivitis

℞ Zinc Sulphate	gr. 2 to 4	℞ Acetic Acid Dil.	m 10
Boric Acid	gr. 5	Distilled Water to	℥i
Distilled Water to	℥i	May be used frequently.	
To be used twice daily.			

Spring Catarrh

CONDYLOMATA OF ANUS

Wash condylomata with Biniodide of Mercury, dry carefully and dust on:—

℞ Hydrarg. Subchlor.	} Equal parts.
Crem. Preparatæ	
Acidi Tannici	

CONSTIPATION

The causes of constipation are almost as numerous as the drugs which have been recommended for its relief.

The following points should be kept in mind:—

1. If in middle age, constipation supervenes, in a patient whose bowels were previously regular, and gradually increases in severity, this should lead to the suspicion of a new growth in the colon although physical signs of a tumour are absent.
2. The presence of *faecal* matter in the rectum does not exclude obstruction above.
3. The presence of *scybalæ* in the rectum is against obstruction and in favour of functional constipation.
4. It is important to see that the bulk of the food is sufficient: constipation is as frequently due to insufficient quantity as to unsuitable quality.
5. A point that is of special importance in the tropics is the excessive absorption of fluid from the colon to provide the all-essential perspiration: in these cases the patient must drink much larger quantities of fluid.
6. Sufficient time must be spent by the patient over the act of defæcation: the bad habit of rushing the act is often contracted at school.
7. In sub-acute cases of functional constipation with coated tongue, abdominal uneasiness and headache, the treatment is best begun by a mercurial aperient followed by a Saline.
8. The subjects of migraine cannot take Calomel, and it always causes them great distress.
9. *Diarrhœa* may be a symptom of constipation, the *faecal* mass irritating the lower bowel.
10. The treatment of functional constipation is frequently a matter of great difficulty, but the majority of cases can be cured without drugs if the proper treatment is begun sufficiently early.

Liquid paraffin is a popular aperient; it is not absorbed and acts mechanically; it makes some patients bilious and others cannot retain it leaking gradually away and soiling the linen. *Cascara* acts more powerfully but has a strong bitter taste, the bitter principal has however been removed in *Cascara Evacuans*. *Aloin* is a good drug especially in combination with *Strychnine* or *Nux Vomica*, *Belladonna* and *Ipecac*, as an after-dinner

pill. Sulphur is useful but has the disadvantage of causing offensive stools. Phenolphthalein is regarded by many as an excellent remedy; it is sold under various names as purgen, laxin, etc. Castor Oil acts very well in the constipation of old people in doses of $\frac{1}{2}$ to 1 drachm.

In spasmodic constipation Olive Oil enonata 4 to 8 ounces at a temperature of 98° are effectual especially if retained all night.

For the surgical treatment of constipation *see* books on General Surgery.

The following prescriptions are recommended:—

R Mag. Sulph.	gr. 30	R Mag. Sulph.	gr. 30
Mag. Carb.	gr. 10	Acid Sulph. Dil.	m 2
Tr. Nux Vom.	m 4	Liq. Strychnine	m 5
Ess. Menth. Pip.	m 4	Ess. Menth. Pip.	m 4
Inf. Senna or Gentian ad.	3j	Inf. Senna or Gentian ad.	3j
To be taken t.d.s. half an hour before food, followed by a tumblerful of hot water.		t.d.s. after food, followed by a tumblerful of water.	
R Aloin	gr. $\frac{1}{2}$	R Ext. Aloes Soc.	gr. $\frac{1}{2}$
Ext. Nux Vom.	gr. $\frac{1}{2}$	Ext. Nux Vom.	gr. $\frac{1}{2}$
P. Myrrhæ	gr. $\frac{1}{2}$	Pulv. Ipecac	gr. $\frac{1}{2}$
Ferri Sulph.	gr. $\frac{1}{2}$	Pulv. Capsici	gr. 1
P. Saponis	gr. $\frac{1}{2}$		one pill.
one pill.		Every day immediately after dinner.	
To be taken shortly before dinner.			
R Ext. Belladonna	gr. $\frac{1}{8}$	R Ext. Belladonna	gr. $\frac{1}{8}$
Aloin	gr. $\frac{1}{8}$	Pulv. Capsici	gr. $\frac{1}{8}$
Strychnine Sulph.	gr. 1/64	Ext. Cascara	gr. 8
Pulv. Ipecac	gr. $\frac{1}{4}$		one pill.
one pill.		One, every night when required.	
Twice daily.			

CONSTIPATION IN CHILDREN

This is a most important condition. Habitual constipation in the adult is often the result of bad habits formed at school, the child not taking, or not being given, sufficient time for the daily opening of the bowels. The bowels can be taught to act daily at any given time, and this habit should be encouraged in every child. An efficient child's nurse will so train an infant that, after the early months, the napkins are seldom soiled.

In treatment, do not give purgatives to the mother with the idea that an aperient effect will be conveyed to the child by the mother's milk, as this method is useless. Absolutely forbid the use in the nursery of enemas and suppositories of any kind.

Avoid severe purgatives, as the subsequent constipation is always more difficult to treat. Massage along the line of the colon is most useful. If drugs are necessary, try Syrup Senna or Pulv. Glycerh. Co. at bed-time or Aloes. The following prescriptions are recommended by Hutchison:—

<i>Constipation in Bottle-fed Babies</i>		<i>Constipation in Breast-fed Babies</i>	
R Soda Phosphate, 5 to 10 gr. added to each feed.		R Fluid Magnesia	1 to 4 3
R Sulphur, 1 gr.		<i>Constipation in Older Children</i>	
R Confection Sulphur, half-teaspoonful, if motions are hard, and passed with difficulty and tenesmus.		R Sod. Sulph.	3j
		Tr. Aloes	m 15
		Syrup Senna	5ss
R Tr. Podophyllin, 1 to 2 m, when motions are white, chalky, and friable.		R Pulv. Rhei	gr. 5 to 10
		Hydrarg. cum Creta	gr. 1
			or more.

Chronic Constipation

R Tr. Aloes	...	...	m 3 to 5
Sod. Sulph.	...	...	gr. 10
Tr. Belladonna	...	...	m 1
Syrup Ginger (or Syrup Senna)	...	...	m 20
Aqua Menth. Pip. ad.	...	...	3j

Costiveness may result from dryness of the stools from too little fluid being taken; therefore plain water or barley water should be taken between meals. Once a mild catarrh of the bowel is set up for any cause the faecal masses are covered with slime and the bowel contractions slip over them without being effective in expulsion.

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CONTRACTED PELVIS—See Obstetrics.

CONVULSIONS, INFANTILE

The causes of Convulsions are:—

1. *Epilepsy*:—

10 per cent. of cases of Epilepsy begin as convulsions in infants. (Gowers.)

2. *Toxic*:—

(a) The onset of specific fevers, taking the place of the rigor in the adult.

(b) Malaria.

(c) Uræmia.

3. *Reflex Irritation*:—

Gastro-intestinal—Food or worms. Colic.

4. *Gross Lesions of the Brain*:—

(a) Meningitis.—Various forms.

(b) Cerebral hæmorrhage, tumour, abscess, syphilis.

(c) Infantile hemiplegia.

5. *Diseases of the Nervous System and Heat stroke.*

TREATMENT.—The immediate treatment is the same, no matter what the cause. Place the child in a hot bath, with or without mustard, and give Chloral, gr. 3, per rectum, in a child under 6 months; if the convulsions are severe and continue, a few whiffs of Chloroform or inhalation of amyl nitrite. Emetics are never advisable.

TO PREVENT RECURRENCE.—Careful attention to feeding; if sedatives are required, Chloral is the best, and is more efficient than Bromides, or the two may be combined:—

R Chloral Hydras.	...	...	...	gr. 1½
Sod. Bromidi	...	...	...	gr. 2½
Syrup	...	...	...	m 20
Aquam ad.	...	..	...	3j

While reflex causes of irritation as rickets, naso-pharyngeal obstruction, worms, phimosis, eye and ear trouble should be attended to.

CORNEAL ULCER—*See Diseases of the Eye.*

CORNS. (CLAVUS)

This is a dense thickening of the horny layer usually conical. It should be remembered that intermittent pressure causes growth, constant pressure atrophy. The best application is Salicylic Acid dissolved in collodion, cannabis indica being added to diminish the pain. Apply every night until the dead epidermis separates in about a week.

R Salicylic Acid	ʒss	If one course is not sufficient, it must be applied again and again until the surface is quite level.
Tr. Cannabis Ind.	m 20	
Collodion	ʒss	

SOFT CORNS—are best treated by scraping to remove the softened epithelium, the surface then being protected by a pad of absorbent cotton dusted with Zinc Oxide and Boric Acid. To prevent recurrence the cause producing the corns, which is either undue pressure brought about by contracted or displaced toes, or by incorrect foot wear, must be removed.

CORONARY THROMBOSIS—*See Cardiac Disease.*

COUGH

Dry Irritable Cough

R Apomorphine	gr. 1/20
Syrup Picis Liq. B.P.C.	ʒj to ij
Syrup Pruni Virg.	ʒj

or

R Syrup Apomorph. Hyd.	ʒj
Syrup Picis Liq.	ʒj
Syrup Papay. Alb.	ʒj
Aquam ad.	ʒss

Troublesome Cough

R Syrup Codeine	ʒss
Syrup Tolu.	ʒss
Syrup Pruni Virg.	ʒss

or

R Aceto-Morph. Hydrochlor.	gr. 1/80
Vinum Ipecac	m 6
Syrup Tolu.	ʒss
Mist. Amygdalæ ad.	ʒss

Spasmodic Cough

R Vin. Antimoniale	m 10
Syrup Papaveris	ʒss
Aquam ad.	ʒss

Tickling Cough

R Heroin	gr. 1
Acid Hydrocyan. Dil.	m 30
Oxymel Scillæ	ʒij
Syrup Limonis	ʒij
Aquam ad.	ʒj

Dose one teaspoonful.

Chronic Cough

R Oxymel Scillæ	m 20
Vinum Antimoniale	m 6
Mist. Ammoniaci ad.	ʒss

R Hydrag. Subchlor.	gr. ʒ
Pil. Ipecac Scillæ	gr. 8

One pill t.d.s.

Linoli

R Menthol	gr. ʒ
Terpene Hydrate	gr. 2
Heroin Hydrochlor.	gr. ʒ
Essentia Limonis	m 40
Sp. Chloroformi	m 40
Syrup Pruni Virg.	ʒss
Syrup Tolu.	ʒss

A teaspoonful when required.

R Heroin Hydrochlor.	gr. 1/24 to 1/12
Syrup Pruni Virg.	m 20
Terpene Hydrate	gr. ʒ
Glycerine	m 20
Sp. Vini Rect.	m 20

A teaspoonful occasionally.

CRAFT PALSIES

This is essentially a condition of cerebral fatigue for this particular movement. The limb is normal for all other movements.

TREATMENT.—Drugs are useless, electrical treatment and massage are only palliative; the patient must give up the movement for three months.

CRAMPS

Are a symptom in arsenical and bacterial food poisoning, in cholera, strychnine poisoning, tetanus, tetany and paralysis agitans, nocturnal cramps with flatulent indigestion, intermittent cramps, and those who work in a hot atmosphere with excessive sweating, the latter condition is now known to be due to loss of salt from the body and is best treated by drinking large quantities of salt and water, a teaspoonful to the quart. Intermittent cramps react remarkably to a course of hypodermic injections of muscle extract, or Iodides or Nitrites internally. Recurring nocturnal cramps with indigestion an alkaline carminative draught at bed time should be given or Aspirin or Antipyrin 10 gr.

R Tr. Cardamon Co.	...	...	5ss
Sod. Bicarb.	...	...	gr. 15
Sp. Amm. Aromat.	...	...	m 15
Sp. Chloroform	...	...	m 20
Aquam ad.	...	...	3ss

Cramps from over-fatigue are relieved by hot baths, energetic massage and liniments of chloroform or belladonna.

CRETINISM

If the diagnosis is not made early and the treatment begun at once, while the physical development may be rapid and ultimately satisfactory, the mental development is unlikely to reach the same level and will always be defective. Liq. Thyroid m 2 increasing 1 m per week up to 5 to 10 m, or $\frac{1}{2}$ gr. of the dry thyroid in powder or tablet increasing to 1 gr. every night at bed time. When the fullest development has been reached, sufficient must be continued for the remainder of life to maintain normal metabolism.

CROUP

By this term is meant a catarrhal laryngeal spasm. The history of a typical case is a child of about five years, has a cold and cough of which little notice is taken. On going to bed the child falls asleep, but wakes up in the night in a state of alarm with dyspnoea and crowing respiration. The attack lasts about one to two hours, suddenly stops and the child falls asleep. The attacks may recur for 3 or 4 nights. The condition is never fatal.

Treatment must be considered under treatment of the attack and prevention of recurrence.

THE ATTACK.—Place the child in a hot bath with mustard two table-spoonsful to the gallon. Give an emetic of 10 gr. of powdered Ipecac (not Vinum Ipecac, which is uncertain), hot fomentations to the larynx, and if possible a bronchitis kettle should be used. Per rectum give Amm. Bromide 15 gr., Chloral Hydrate 7 gr. in water. Next day a dose of Calomel and the following mixture every three hours:—

R Vinum Antimon.	...	...	...	m	5
Vinum Ipecac	...	...	...	m	5
Oxymel Scillæ	...	...	...	m	10
Aqua Anethi ad.	...	...	...		3i

Every 3 hours.

TO PREVENT ATTACKS.—Adenoids if present should be treated, the child should be accustomed to the open air, but should not sleep in a damp cold room.

CURETTAGE OF THE UTERUS—See Endometritis.

CUT THROAT

Generally suicidal, rarely homicidal, and usually deeper on the left side; but as the head is thrown backwards when the cut is made, the trachea and larynx are injured while the great vessels escape. Unless there is serious hæmorrhage or respiratory difficulty, give a hypodermic of Morphia.

Hæmorrhage is generally stopped by the time the patient is seen; and treatment is directed to preventing asphyxia, by removing blood in the lower part of the trachea and bronchi, by suction through a soft catheter; tracheotomy should be performed if respiration is much embarrassed; if the trachea is wounded, a tracheotomy tube should be introduced through the wound.

As soon as respiration has been relieved and hæmorrhage arrested, a dressing should cover the wound, and the head be fixed in the flexed position, the patient sitting up.

When the patient has recovered from shock, under an anæsthetic the divided structures should be accurately sutured. The hypoglossal and recurrent laryngeal nerves are frequently divided. Special care must be taken to accurately suture wounds of the larynx and trachea.

The shock may be out of all proportion to the severity of the wound and necessitate intravenous saline.

Great care is necessary in the after-treatment, the mental condition of the patient requiring special nursing care.

CYSTITIS

ACUTE CYSTITIS.—The patient is kept in bed on a low diet, all spiced foods, curries, meat, coffee and alcohol being forbidden. Large quantities of barley water should be drunk. Hot sitz baths, fomentations or antiphlogestin being applied to the perineum and hypogastrium, a hot rectal enema or vaginal douche containing Antipyrin will often relieve. Whatever is the reaction of the urine, it must be changed.

If the Urine is Alkaline, give :—		If the Urine is Acid, give :—	
R Urotropine	gr. 5 to 15	R Pot. Citrate	gr. 15
Acid Sod. Phosph.	gr. 30	Pot. Bicarb.	gr. 15
Tr. Hyos.	ʒss	Tr. Hyos.	m 30
Glycerine	m 20	Inf. Buchu ad.	ʒj
Inf. Buchu ad.	ʒj	4 hours.	
t.d.s.			

Serum therapy may be useful. Instruments should not be passed, and no attempt should be made to wash out the bladder unless the urine becomes very foul.

SUB-ACUTE CYSTITIS.—The patient may be allowed up, bladder washing should be commenced, and an autogenous vaccine will probably be found useful.

CHRONIC CYSTITIS.—If urethral, prostatic or renal disease is present this must be treated, pyelitis is the commonest cause of persistence and recurrence. Bladder washing plays a prominent part in all cases, in acid cystitis a preliminary washing with Sod. Bicarb. solution 2 per cent. and in very alkaline cystitis a $\frac{1}{2}$ per cent. Acetic Acid solution.

The following solutions may be used as bladder washes:—

Pot. Permang. 1 in 5,000 to 1 in 10,000.
 Hydrarg. Perchlor. 1 in 5,000.
 Silver Nitrate 1 in 2,000 to 1 in 10,000.
 Boric Acid a saturated solution
 Tr. Iodi. ʒj to Oj.

VACCINE TREATMENT.—B. Coli is most frequently used, a dose of 3 M. gradually rising to 100 or even 200 M. The Staphylococcus in doses of 100 to 1,000 M. The Streptococcus from 2 M. to 10 M. The treatment may extend to several months.

In intractable cases drainage may have to be carried out by a catheter in the urethra or by the suprapubic or perineal route.

TUBERCULOUS CYSTITIS.—If the infection is mixed urinary antiseptics should be used, but in pure tuberculosis they are not effective. Sandalwood Oil with Belladonna and Hyoscyamus is soothing and relieves spasm.

R Oleum Santali	℥ 15	R Acid Boracic	gr. 5
Tr. Belladonna	℥ 5	Tr. Belladonna	℥ 7
Tr. Hyos.	5j	Tr. Hyoscyamus	℥ 30
Mucil. Acacis	q.s.	Sp. Chloroformi	℥ 15
Aqua Chloroformi ad.	3j	Inf. Buchu. ad.	3j
t.d.s.		t.d.s.p.c.	

Tuberculin should be given in all cases and is frequently most effective. Heliotherapy is of value.

As regards local treatment bladder washings and instillations almost invariably lead to septic infection being added. In some cases direct application can be made of Nitrate of Silver through a cystoscope.

DACRYOCYSTITIS—See Lachrymal Apparatus Diseases of the Eye.

DANDRUFF OR SEBORRHŒA

There are two kinds: one due to excessive activity of the sebaceous glands, which makes the scalp very oily. The second is the presence of epithelial scales known as scurf or dandruff. The former is treated by washing the scalp and a shampoo, with the use of a spirituous hair lotion such as:—

R Resorcin	...	...	...	3j
Etheris	...	...	...	3j
Rectified Spirit	..	...	...	3j
Eau de Cologne	...	...	...	3ss
Aquam ad.	...	...	...	3vi

The second condition is more serious as it is frequently the forerunner of baldness. One of the two following prescriptions should be regularly and systematically used.

R Sulph. Præcip.	3iij	R Acid Salicyl.	gr. 20
Oleum Theobrom.	3iv	Sulph. Præcip.	gr. 20
Oleum Ricini	3ix	Paraff. Moll. Alb.	3j
Apply after the scalp has been well cleansed.		(Ward.)	
		Apply after the scalp has been well cleansed.	

DELHI BOIL—See Oriental Sore.

DELIRIUM TREMENS—See Alcoholism.

DENGUE FEVER

Dengue and Sandfly fever are very closely related. In both the virus is filterable and ultra-microscopic, in the former it is conveyed by a stegomyia mosquito, which bites a dengue patient during the first three days of his attack, but it is only after about 11 days that the mosquito becomes infective, but then remains infective for the rest of its life. As regards treatment there is no specific. Quinine is useless and only increases the headache. Give complete rest in bed, with hot applications to the joints, and aspirin internally for the pain which in some cases may be so severe as to require morphia.

DENTAL CARIES—*See* article on Dental Surgery.

DENTITION

Children vary greatly in their reaction to dentition. Some although in great discomfort present no symptoms, while others are completely upset and without physical signs run an indefinite pyrexia. *See* causes of prolonged Pyrexia in Children. The following prescriptions have proved useful:—

R Chloral Hydras	...	...	...	gr. 2
Pot. Brom.	...	...	...	gr. 2
Spirit Ammon. Aromat.	...	...	...	℥ 2
Syrup Pruni Virg.	...	...	...	℥ 10
Aquam ad.	...	...	...	3j

Every 2 or 3 hours.

This powder is most efficient in the second dentition.

R Calomel	...	...	...	gr. $\frac{1}{8}$
Euonymin	...	...	...	gr. $\frac{1}{8}$
Sacchar Alb.	...	...	...	gr. $\frac{1}{8}$

The powder at night.

DERMATITIS, OCCUPATIONAL

In many persons there is an inborn fragility of the skin, which may be temporarily aggravated by employment, such as cement, flour and sugar mills, also the handling of turpentine, resins and fluid dyes.

After cleaning up the surface with boric fomentations apply one of the following:—

R 2% Malachite Green in 80% Alcohol	or R Calaminæ	gr. 35
2% Mercuric Chloride in	Liq. Calcis	℥ss
80% Alcohol	Oleum Olivæ ad.	3j
Mix equal parts and spray on.	Apply the cream.	

DHOBIE ITCH. (TINEA CRURIS)

Tr. Iodi. is excellent in recent cases, and there are no lesions of eczema. Otherwise one of the following ointments may be rubbed in every night for a week:—

R Benzoin Acid	gr. 80	or R Resorcin	3i
Salicylic Acid	gr. 24	Acid Salicylic	gr. 10
Linseed Oil	3ss	Vaseline	3iv
Wool Fat	3ss	Lanoline	3iv

Followed by the application of Calamine lotion in the morning. The prescriptions of Malachite Green and Mercuric Chloride given under Dermatitis Occupational are often effective. A strong application is:—

R Chrysarobin	...	...	gr. 10 to 25
Ung. Zinci	...	...	3j

If the resulting irritation is very great, apply Lotion Calamine or Ung. Ichthyol 1 per cent.

DIABETES INSIPIDUS

This includes several clinical conditions differing fundamentally in their pathology:—

1. Polyuria the result of pituitary disorder.
2. A syphilitic basal meningitis.
3. Following fracture of the base of the skull.
4. Hysterical and nervous polyuria.

TREATMENT.—This must in the first place exclude the syphilitic factor. The only form of treatment which is generally successful is the intra-muscular injection of Pituitary extract $\frac{1}{2}$ c.c. twice daily, given by the mouth it is useless, but recently it has been found that it is effective if instilled into the nose in half strength. Lumbar puncture has a remarkable but temporary relief, 5 to 10 c.c. being removed, but this of course a treatment which cannot often be repeated.

DIABETES MELLITUS

If sugar is present in the urine as determined by Benedict or Fehling's test, the case is probably diabetes. The only conditions with which it could be confused are Renal Glycosuria in which, however, the percentage of sugar in the blood is normal. Pancreatic disease—inflammation or trauma, conditions which are rare, and accompanied by large fatty stools. Or patients with gastro-enterostomy or an inflammatory condition around

the biliary tract. If difficulty arises a blood sugar curve should be taken.

Having determined that sugar is present, the next point is to estimate the quantity in grammes in the 24 hours. To fully understand the treatment of diabetes mellitus it is important to realize that since the disease was recognized it has passed through three stages of treatment.

1. The limitation of the carbohydrate intake; this was the only treatment available for many years, and while moderately effective in middle-aged and senile diabetics, gave no satisfaction with severe or even moderate cases, and if pushed, produced Ketosis and Coma from disordered fat metabolism.

2. The second stage was the starvation treatment of Allen. There was at first a varying period of starvation by which hyperglycemia and glycosuria disappeared, the diet was then carefully built up by small additions to the protein, fat and carbohydrate groups until sugar reappeared in the urine. A few days' starvation was then ordered to stop the sugar in the urine, and the carbohydrate content of the diet was then fixed at a point below that at which sugar appeared in the urine. Protein was allowed at 1 to $1\frac{1}{2}$ grammes per kilo of body weight, and the amount of fat and carbohydrate balanced so as to avoid glycosuria on the one hand and ketosis on the other.

The whole object of this starvation was to give a diet which the diminished activity of the pancreas could deal with, and thereby avoid pancreatic exhaustion. While this treatment was satisfactory in a number of moderate cases who led quiet lives, in the more severe cases the hypoglycemia and glycosuria could only be controlled on a diet, which amounted to starvation especially in those leading an active existence.

3. To control the effects of insufficient internal pancreatic secretion came the third era, the discovery, isolation and preparation of the hormone Insulin or the internal secretion of the pancreas.

The treatment of diabetes can therefore be considered under:—

- (1) Diet alone—As for some of the milder cases restriction of all classes of foodstuffs may alone be sufficient.
- (2) By diet plus the use of Insulin, but it must be clearly understood that treatment by Insulin does not obviate restriction of diet.

If treatment is to be based on diet alone, that diet must contain the essentials and proportion of protein, fat and carbo-

hydrate to maintain the health and weight of the patient, in his circumstances of life and work, and in the case of children for growth and development. It must keep the patient free of glycosuria, hypoglycaemia and ketosis. If these cannot be attained by diet alone Insulin must be given.

Many patients can be kept on a diet without Insulin by Graham's Ladder Diets (see *Lancet*, May 1st, 1926) while this ladder or starvation method has the advantage of simplicity and is easy to work. It has the disadvantages that there is a considerable loss of weight in the early stages, and it may tend to ketosis, it is distasteful to the patient, and rest in bed is essential.

How can a diet be calculated which provides the minimum requirements of any given patient?

Research has shown that a normal person at rest requires 25 Calories per kilo of body weight, i.e. the basal minimum diet.

Sedentary life requires 30 to 40 Calories per kilo of body weight. Hard work requires 40 to 60 Calories per kilo of body weight.

Therefore a patient weighing 60 kilos with hard work will require a diet which provides $60 \text{ kilos} \times 50 \text{ Calories} = 3,000 \text{ Calories per day}$.

Now 1 gramme of Protein = 4 Calories, 1 gramme of Carbohydrate = 4 Calories and 1 gramme of Fat = 9 Calories, so that from this calorific value of the food constituents, it is easy to calculate the amount of food necessary to provide the required Calories.

Knowing the number of Calories required the next point is to combine the Protein, Carbohydrate and Fat constituents of the diet in the proportions which give the best results.

Research has shown that 1 gramme of Protein per kilo of body weight is sufficient for the adult. R. D. Lawrence in his book 'Diabetic Life' gives a simple formula for estimating the number of grammes of Carbohydrate and Fat sufficient to give a diet of any required calorific value, and one in which the C: F ratio is maintained at 1: 3. This formula is:—

$P = 1 \text{ gramme per kilo of body weight.}$

$C = \frac{\text{Total Calories required} - \text{Protein Calories}}{80}$

$F = 3C.$

From this in the ordinary way a diet would have to be worked out which would supply the number of grammes of Carbohydrate, Protein and Fat. Lawrence has however compiled a table

called the 'Line ration' diet scheme and is based on the ratio of 1C. 1.5P: 3F, and avoids all the trouble of drawing up diets.

Each line in the diet-table contains 5 grammes C, $7\frac{1}{2}$ grammes P and 15 grammes F. The table has two divisions: a black or carbohydrate and a red or protein and fat division. One red and one black portion together make one line of the diet. 190 Calories is approximately the value of each line. If the total number of Calories required is divided by the calorific value of the line of diet this will give the number of lines required. Thus 1,900 Calories equals 10 lines. Finally the lines are proportioned up with the daily meals.

FIRST HALF-LINES (=5 grammes C).

Cabbage, greens or rhubarb ...	8	oz.
Lettuce, celery or cress (all raw) ..	8	„
Cauliflower, asparagus, French beans ...	8	„
Cucumber, radishes (raw) ...	8	„
Marrow, scarlet runners, stewing goose-berries.	7	„
Brussels sprouts, endive (raw) ...	6	„
Tomato (raw or cooked), turnips or leeks	5	„
Red currants, water-melon (raw) ...	$4\frac{1}{2}$	„
Grape-fruit in skin ...	4	„
Milk, cherries, or blackberries (stewed)	$3\frac{1}{2}$	„
Stewing greengages, damsons or plums	$3\frac{1}{2}$	„
Strawberries, raspberries, loganberries (raw).	3	„
Onions, apples or black currants ...	3	„
Carrots or Jerusalem artichokes ...	3	„
Orange (skinned), pears (stewed) ...	$2\frac{1}{2}$	„
*Beetroot, apple (raw) ...	2	„
*Parsnips or fresh peas, prunes (stewed)	$1\frac{1}{2}$	„
*Potato, banana (skinned) ...	$\frac{3}{4}$	„
*Bread (all kinds) ...	$\frac{1}{4}$	„
*Oatmeal (raw), biscuit or toast ...	$\frac{1}{4}$	„

SECOND HALF-LINES (= $7\frac{1}{2}$ grammes P, 15 grammes F).

One egg and fat $\frac{1}{4}$ oz.
 Bacon 1 oz.
 Ham 1 oz. and fat $\frac{1}{4}$ oz.
 Kipper $1\frac{1}{2}$ oz. and fat $\frac{1}{2}$ oz.
 Herring 1 oz. and fat $\frac{1}{2}$ oz.
 Lean meat or mutton 1 oz. and fat $\frac{1}{2}$ oz.
 Lean lamb or veal 1 oz. and fat $\frac{1}{2}$ oz.
 Lean pork 1 oz. and fat $\frac{1}{2}$ oz.

* These articles to be taken only if specially allowed by the physician.

Chicken or duck 1 oz. and fat $\frac{1}{2}$ oz.
 Tongue (tinned) 1 oz. and fat $\frac{1}{4}$ oz.
 Liver 1 oz. and fat $\frac{1}{2}$ oz.
 Kidney or tripe $1\frac{1}{4}$ oz. and fat $\frac{1}{2}$ oz.
 Rabbit $\frac{1}{2}$ oz. and fat $\frac{1}{2}$ oz.
 Cheese $\frac{3}{4}$ oz. and fat $\frac{1}{4}$ oz.
 White fish or sweetbreads $1\frac{1}{4}$ oz. and fat $\frac{1}{2}$ oz.
 Sardines 1 oz. and fat $\frac{1}{4}$ oz.
 Salmon 1 oz. and fat $\frac{1}{2}$ oz.
 Crab or lobster $1\frac{1}{2}$ oz. and fat $\frac{1}{2}$ oz.
 Pheasant, grouse or partridge $\frac{3}{4}$ oz. and fat $\frac{1}{2}$ oz.

Fats are meat fats, suet, dripping, butter, margarine, olive oil; thick cream (twice the amount).

IN INFANTS AND CHILDREN.—Diets of much higher calorific value are necessary for development, growth and weight.

While many Indian diabetic patients are extremely stout, and would benefit by this treatment, it must be evident to anyone who has any experience of Indian practice, that it would be exceedingly difficult to carry out. My personal experience, of the observation of a large number of Indian diabetic patients, for a number of years, is that the prognosis is much better in the Indian, than in the European. A number of patients in whom a bad prognosis would have been given, if judged from the Western standard, have led useful lives for years, with little discomfort, except occasional attacks of emaciation, provided that they are strictly moderate, and at times exclude rice, sugar, and potatoes from their diet. The following has been found useful for Indian diabetic patients:—

Early morning.—Milk 12 oz. with a chapati made of almond flour or cocoanut.

Principal meal at noon.—Chapati or rice in moderation; dal, green vegetables, especially spinach, fruit, and a small quantity of ghee.

Evening meal, 7 or 8 p.m.—Curds (dahi) or milk with a cocoanut cake.

The juice of fresh limes should be drunk with water, at least twice daily.

ADMINISTRATION OF INSULIN.—The object is to arrive at the more or less permanent dosage of Insulin, that will metabolize the carbohydrate intake on the diet of required calorific value. Insulin is usually commenced in small doses of 5 units half an hour before breakfast, and half an hour before the principal evening meal, and increased to 10 in the morning and 5 in the evening, and then to 12 and 8,

and 15 and 10 until the glycosuria has disappeared. The object of giving the larger dose in the morning is to meet the higher blood sugar at that time and the demand for early meals in the day. The second prevents the risk of hypoglycæmia occurring during the night when no food is taken. The blood sugar 3 to 4 hours after the last dose of Insulin should be within the safe limits of 0.09 to 0.12.

After a few weeks of Insulin treatment there may be some recovery in the pancreas, with an increase of its own Insulin. This will require a reduction of the dose of Insulin or an increase in the diet, according to the condition of weight and nutrition of the patient. It should be remembered that once Insulin is started there is no reason why it should not be stopped if the patient regains tolerance.

The continuance of treatment after stabilization has been effected requires the most careful co-operation of the patient. His life must be one of moderate physical and mental exertion, with regular action of the bowels. Avoidance of all sources of infection and sepsis, with strict cleanliness of the teeth and gums. He must weigh himself regularly; and accurately measure his food. Testing his urine for sugar with Benedict's solution and for Acidosis with Ferric Chloride.

The patient must be careful to take a meal not more than a quarter of an hour after each injection, and the Insulin must never be taken in one large dose or late in the evening. The effect of a single dose lasts for about 8 hours, but no unpleasant symptoms are likely to develop after five hours.

The most important risk is that of an over-dose causing hypoglycæmia. This may be due to over-exertion, insufficient carbohydrate or an increase of the patient's own Insulin. The symptoms in order of progress in an untreated case are:—Tremor, palpitations, weakness, hunger, aphasia, faintness, flushing or pallor, sweating, delirium, convulsions and coma.

The following are the diagnostic points between:—

<i>Hypoglycæmic Coma</i>	and	<i>Diabetic Coma</i>
1. Taking Insulin.	1.	.....
2. Very sudden onset.	2.	Slow onset, constipation and intestinal upset.
3. Respiration rapid.	3.	Respiration very deep, slow.
4. Pulse slow.	4.	Pulse rapid.
5. Skin moist.	5.	Skin dry.
6. Eye-ball normal tension.	6.	Eye-ball very soft.
7. Sugar Nil.	7.	Sugar present.
8. Ketone Nil.	8.	Ketone bodies present.

TREATMENT OF HYPOGLYCÆMIA—is rest and sugar. If the symptoms are urgent give intravenous Glucose 5 to 20 per cent. with Adrenalin 10 to 15 m or Pituitrin 1 c.c.

TREATMENT OF DIABETIC COMA.—1. A large dose of Insulin not less than 50 or more than 100 units. Some intravenously but two-thirds subcutaneously, as it is rapidly absorbed and the action is prolonged.

2. Glucose.—Give as many grammes of Glucose as units of Insulin. It gets rid of the ketone bodies rapidly and avoids risk of Hypoglycæmia. Give by means of stomach tube with large amounts of water and leave the tube in the stomach.

3. Sod. Bicarb. ʒj may be given every hour for 2 or 3 hours, if large doses are given patient will die in tetany.

4. Wash out the Colon.

5. Look for any septic focus that should be opened and drained.

6. Pass a catheter, examine the urine at once and then after every three hours.

7. If at the end of three hours the patient is not out of coma, repeat half the amount of Insulin and half the amount of Glucose.

Other complications are:—

BOTLS AND CARBUNCLES.—See treatment under these heads.

CONSTIPATION.—Salines, Senna, Castor Oil.

CRAMPS, NOCTURNAL.—Sod. Bicarb. gr. 10 to 15 at bed time.

GNAWING PAINS IN THE LEGS.—Antipyrin 10 gr. t.d.s.

ECZEMA OF THE VULVA OR PREPUCE.—Scarlet Red Ointment.

PRURITUS.—

R Thymol	ʒiv	or R Menthol	gr. 20
Liq. Potassæ	ʒij	Pulv. Camph.	gr. 25
Glycerine	ʒvi	Phenol	gr. 25
Aquam ad.	1 pint.	Adipis Benzoat.	ʒij
or			
R Acid Hydrocyanic Dil.	...	...	ʒj
Glycerine	...	...	ʒj
Aquam ad.	...	...	ʒvi

FLATULENCE.—Creosote or Thymol with Ext. Belladonna.

GANGRENE.—It is frequently a terminal condition, if moist with sepsis, operate immediately. If this is impossible, cover with Sodium Pyroborate powder and use hot air douche at 100° to 300° C.

TUBERCULOSIS.—Not always of such fatal import as in pre-Insulin days. It is important to give Insulin in order to keep up a high Calorie diet.

GALL-BLADDER DISEASE.—There is a relation between Gall-bladder Disease and Diabetes. Operation is a matter of importance, as it will sometimes completely clear up the case.

SURGICAL OPERATIONS.—If essential, the anæsthetic should be local, spinal or gas and oxygen, but not chloroform. If there is much sugar, 20 to 40 units of Insulin should be given with a corresponding amount of Carbohydrate every four hours.

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DIARRHŒA

Strictly speaking diarrhœa is a symptom, but it is frequently the only symptom requiring treatment, and must therefore be considered as a separate condition. It should be defined as the too rapid passage of the intestinal contents through both small and large intestine. It can be divided into Acute and Chronic.

The causes under the former are.—Indigestible food, food-poisoning from chemical or more frequently bacterial irritants, chill in predisposed people. Ulceration of the bowel by tubercle, carcinoma, dysentery, typhoid, and the various forms of colitis.

Chronic Diarrhœa may be of gastric origin due to deficient HCl in the gastric juice, elimination of toxins as in uræmia, sprue, dysenteries, etc.

It is a most important point to insist on seeing the stools in every case of diarrhœa.

TREATMENT IN ACUTE DIARRHOEA.—Rest in bed with a diet of milk that has been boiled is effective, and will cure the majority of cases; in less severe cases the diet may include ground or boiled rice, sago, arrowroot, custard or egg-flip, but must exclude meat or meat extracts, vegetables, fruit and nuts. If there is much pain or the patient is at all collapsed, give Brandy \mathfrak{zss} every 2 to 3 hours.

MEDICINAL.—It is generally a good plan to clear the irritating contents of the bowel with Castor Oil in one of the following mixtures:—

R Oleum Ricini	\mathfrak{zvj} to \mathfrak{zj}	or R Oleum Ricini	\mathfrak{zvj}
Sp. Vini Gallici	\mathfrak{zj}	Pulv. Tragacanth	\mathfrak{zj}
Tr. Opii	\mathfrak{m} 10	Syrupi	\mathfrak{ziv}
Aqua Cinnamon ad.	\mathfrak{zjss}	Aqua Menth. Pip. ad.	\mathfrak{ziii}
To be taken at once.		\mathfrak{zj} immediately and repeated every 2 hours until a good action results.	

Then give one of the following sedative and astringent mixtures:—

R Bismuth Carb.	gr. 20	or R Bismuth Salicylate	gr. 20
Acid Hydrocyanic Dil.	\mathfrak{m} 4	Tr. Opii	\mathfrak{m} 8
Liq. Morph. Acet.	\mathfrak{m} 15	Sp. Amm. Aromat.	\mathfrak{m} 25
Pulv. Tragacanth	q.s.	Aquam ad.	\mathfrak{zj}
Aqua Chloroformi ad.	\mathfrak{zj}	Every 4 hours.	
Every 4 hours.			

Or Opium with vegetable astringents, or a combination of astringents as:—

R Tr. Catechu	\mathfrak{zj}	R Pulv. Cretæ Aromat.	gr. 20
Tr. Opii	\mathfrak{m} 8	Pulv. Kino Co.	gr. 15
Sp. Amm. Aromat.	\mathfrak{m} 25	The powder every 4 hours.	
Ess. Menth. Pip.	\mathfrak{m} 4	or	
Aquam ad.	\mathfrak{zj}	R Pulv. Ipecac Co.	gr. 10
Every 4 hours.			

If a rapid result is desirable Morphia gr. $\frac{1}{4}$ to $\frac{1}{8}$ hypodermically.

TREATMENT IN CHRONIC DIARRHOEA.—Rest, warm rooms and clothing are important. Special care should be taken with the regulation of diet, condiments, new bread and tough meat being excluded.

Medicinal treatment will largely depend on the cause of the diarrhoea:—

R Tannalbin.	gr. 10 to 20	or R Tannoform	gr. 10
In cachets t.d.s.		Bismuth Salicylate	gr. 5
		For one cachet t.d.s.	

R Creosoti	℥ 2	or	R Acid Sulph. Aromat.	℥ 15
Liq. Ext. Hamatoxyli	3j		Sp. Chloroformi	℥ 10
Mist. Cretæ ad.	3j		Dec. Hamatoxyli ad.	3j
Every 4 hours.			t.d.s.	

Lienteric Diarrhœa

R Sod. Bromide	gr. 12	or	R Codeine	gr. ½
Tr. Opii	℥ 5		Ext. Belladonna Vir.	gr. ½
Aqua Chloroformi ad.	3ss		Pulv. Glycyrrh. Co.	gr. 2
Half an hour before meals.			Pulv. Tragacanth	q.s.
			Half an hour before meals.	

Diarrhœa due to deficient HCl in the gastric juice, give:—

R Acid Hydrochlor. Dil. 3jss in 8 ozs. of water and orange juice to be drunk during meals.

Nitrate of Silver and Lead Acetate are powerful astringents which cannot be given continuously, but may be employed occasionally in the following pills:—

R Silver Nitrate	gr. ¼ to ½	or	R Ext. Opii	gr. ½
			Plumbi Acetatis	gr. 2

For griping and flatulence:—

R Ext. Belladonna	gr. $\frac{1}{2}$	Intestinal Antiseptics are useful in some cases. Mercury in form of Calomel gr. $\frac{1}{4}$ to $\frac{1}{2}$ twice daily for a week, or Grey powder 1 to 2 gr. twice daily with or without Dover's powder.
Menthol	gr. 1	
Ext. Gentian	q.s.	
One pill t.d.s.		

R B. Naphthol or R Naphthalein Tetrachloride gr. 5 in capsule t.d.s. and in the case of the latter rapidly increased to 10 gr. t.d.s.

If the stools are offensive with flatulence:—

R Izal	℥ 2	or	R Charcoal	3j to 3ij
In gelatin coated capsules.		Alone or combined with Kaolin.		

DIARRHŒA IN CHILDREN, ACUTE

TREATMENT.—(1) Stop all food, give only boiled water, or weak barley water in sips.

(2) Wash out the stomach.

(3) Wash out the large intestine with saline.

(4) Keep the child warm in bed.

Give either of the following:—

R Oleum Ricini	℥ 5	or	R Calomel	
Mucilage Tragacanth.	q.s.		Pulv. Doveri	
Aqua Menth. Pip. ad.	3j			
Every 2 or 3 hours for 1 or 2 days.				

Later:—

R Bismuth Carb.	...	...	...	gr. 10
Calomel	...	...	...	gr. $\frac{1}{8}$
Pulv. Ipecac Co.	...	...	...	gr. $\frac{1}{8}$

Suspend the powder in Albumen Water and give
every 4 to 6 hours.

or

R Silver Nitrate	...	...	gr. $\frac{1}{8}$ to $\frac{1}{4}$
Acid Nitric Dil.	...	...	m 1
Glycerine	...	...	m 5
Distilled Water ad.	...	...	ʒij

3 or 4 times daily in the later stages when stools are
offensive and watery.

Lienteric

R Tr. Opii	...	...	m 1 to 2
Liq. Fowleri	...	...	m 1
Tr. Nux Vom.	...	...	m 1
Inf. Aurantii	...	...	ʒj

Just before meals.

HILL DIARRHŒA.—This a gastro-intestinal disturbance with early morning white watery stools and flatulent dyspepsia, but not due to any specific organism, but if neglected may develop into Sprue. It occurs at heights in the tropics of 5,000 to 6,000 feet, especially during the rains.

TREATMENT.—Except in the mildest cases the patient should return to the plains. R Liq. Hydrarg. Perchlor. ʒj fifteen minutes before meals. Or Bismuth Salicylate gr. 25 t.d.s. two hours after meals. The best diet is peptonized milk in small quantities at a time.

DILATION OF THE STOMACH, ACUTE—See complications and Sequelæ of Operations.

DIPHTHERIA

The first important point to remember in the treatment is that if the clinical picture is one of Diphtheria the serum must be given at once, and not to wait for the result of the bacteriological examination. The injection should be intramuscular on the outer side of the thigh. As regards dosage as young children suffer more severely from the disease, the dose, as with drugs, should not be determined by the age, but the extent of the membrane and œdema, date of onset, glandular involvement and toxæmia.

DOSE.—One injection of 4,000 to 8,000 units in mild faucal or nasal cases. If the case has been running two or

three days, double the above. When the membrane has extended to the soft palate, pharynx and naso-pharynx with extensive cervical glandular and periglandular swelling, then give two doses of 12,000 to 16,000 units.

In severe cases with laryngeal Diphtheria and obstruction becoming pronounced, give 24,000 to 48,000 units repeated on two or more successive days.

Anti-toxin given by the mouth or rectum is useless. *See* also Diphtheria Anti-toxin under Specific Therapy.

My experience of Diphtheria in India is that it is not frequently seen, but is unusually severe. If serum is available no internal treatment is necessary, but if anti-toxin is not immediately available the case should be treated with Biniodide of Mercury, which is especially inimical to the Klebs-Loëffler bacillus, and Strychnine, the former can be given in the following mixture:—

℞ Hydrarg. Perchlor.	gr. 1	℞ Pot. Chlor.	gr. 8
Pot. Iodide	gr. 30	Boracis	gr. 5
Glycerine	ʒij	Tr. Myrrhæ	m 10
Aquam ad.	ʒviiij	Aquam ad.	ʒj

A tablespoonful contains less than 1/16 gr. of Biniodide and is a safe dose for an adult every four hours.

To be used as a mouth-wash with a little hot water.

Strychnine should be given hypodermically, it stimulates the centres depressed by the toxins, and is therefore a direct physiological antidote. Local treatment is not essential, gargling causes too much exertion in older children, the above Chlorate of Potash mouth-wash is soothing.

Careful nursing is important, strict recumbency for three weeks must be enforced to guard against heart failure, as in plague. In cases of paralysis this should be extended to six weeks with complete avoidance of muscular exertion.

If attacks of dyspnoea develop, apply hot fomentations to the neck, use a steam tent, and give Pot. Brom. and Chloral, these measures will usually avert an operation. If however the dyspnoea is progressive with great cyanosis and restlessness, laryngeal suction, tracheotomy or intubation are indicated.

DISLOCATIONS

For the special treatment of each dislocation a work on General Surgery must be consulted. It is important that reduction should at once be tried by manipulation, all manipulations aim at rendering patent the capsular rent, and then making the bone retrace its own track, replacement is hindered by tense spasm of surrounding muscles.

After reduction of dislocations a radiograph should be taken to make sure that the reduction is complete, that no fracture co-exists which might heal with sufficient callus formation to interfere mechanically with the joint movements, and to exclude complications such as a loose body in the joint. The result of treatment is usually full usefulness, although for a time there is some aching and stiffness.

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DISSEMINATED SCLEROSIS

The etiology has not been proved, and it is doubtful as to whether recovery or arrest ever takes place. A prolonged course of Arsonic also Liver treatment may be tried.

DIVERTICULITIS OF THE COLON

This condition consists of small hernial pouches of the mucous membrane through the muscular coat of the colon. The proper treatment is resection of the affected part of the colon, apart from this the only possible treatment is to keep the contents of the bowel as fluid as possible with enemata and petroleum.

DIVIDED NERVES

Nerve lesions are frequently not diagnosed by omitting a careful examination, especially in small wounds in the region of the wrist; this examination must of course always be made before anæsthesia is induced for the treatment of the wound. Success greatly depends on strict asepsis.

1. The suture material should be catgut and the needle a round intestinal.
2. As far as possible the suture should be limited to the sheath and encroach as little as possible on the nerve itself; avoid holding the nerve with forceps.

3. A small slice should be cut off each end of the nerve by a sharp scalpel, not scissors, and after suturing, the nerve must be replaced in its bed, and a flap of fascia sutured over the union.
4. The joint is flexed to avoid tension.
5. If the nerve has been extensively destroyed, the surgeon must use his ingenuity to diminish the gap by flexing joints, extensive freeing, gradual stretching and alteration of the course of the nerve.

DIVIDED TENDONS

A careful examination must always be carried out before the patient is anesthetized for the treatment of the wound.

1. An extensive dissection may be necessary to expose the divided ends, as they always retract, especially the proximal end.
2. The correct ends being brought into apposition, they should be sutured through the tendon with silk or cotton thread.
3. The tendon sheath, or failing this, the deep fascia must always be sewn over the suture line.
4. The joint is flexed, to relieve tension, and the limb placed in a splint. Passive movements are started early, when the splint is dispensed with.

DIPSOMANIA—*See* Alcoholism.

DROPSY—*See* (1) Cardiac Disease; (2) Cirrhosis of the Liver; (3) Nephritis.

DROWNED, TREATMENT OF THE APPARENTLY

1. Try and hold the body upside down to let water run out of the mouth and throat. Sweep finger rapidly round the pharynx to remove any obstruction, such as weed, then
2. Put the patient face down on the ground with a folded article of clothing under the lower part of the chest.
3. Place yourself over the patient kneeling and facing his head.
4. Place the palms of the hands over the lower ribs one on each side, and throw forward the body weight so as to give firm pressure on the patient's chest.
5. Without removing the hands raise your body slowly thus increasing the pressure.

6. Repeat this movement at the rate of 15 to the minute, until natural respiration restarts. Then turn the patient on the back, apply friction to the limbs, and hot bottles, and give an ounce of Brandy and hot coffee by the mouth.
7. Continue for at least half an hour or until you are certain the patient is dead.

DRUG ERUPTIONS—*See* Index.

DRUG HABIT

The two important ones are Cocaine and Morphia, of which the former is the more serious and difficult to cure. In the first place it is essential for the patient to be treated in a special institution. There are two ways either to withdraw the drug suddenly or gradually, the former in morphine maniacs certainly causes great suffering, and with either method there is most troublesome insomnia, which should be treated with large doses of Trional 30 to 40 gr.

The most efficient treatment is with large doses of Hyoscine pushed until the patient develops mild delirium, this delirium is maintained for 24 to 48 hours, when the Hyoscine is stopped and the patient wakes having lost his craving. Pilocarpine $\frac{1}{2}$ gr. is then given every hour to produce profuse sweating and so gradually to eliminate the Hyoscine, the interval between injections being gradually increased. This treatment is most effective but requires supervision.

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DYSENTERY

This is considered under (1) Amœbic, and (2) Bacillary.

AMŒBIC.—This is caused by the *Entamoeba Histolytica* infecting chiefly the submucous coat of the large bowel, producing an ulceration which varies from being very acute to very chronic, and may be difficult to cure completely. In the

acute stage the active motile protozoa is easily seen in the mucus of the stool, if the stool has been kept warm and examined soon after it has been passed, but in the quiescent stage of the disease only the encysted forms may be present. Cyst carriers are frequently a source of infection, and flies are a danger as the cysts pass through their bodies unchanged.

The entamoeba has great powers of penetrating human tissues, hence the invasion of the liver.

TREATMENT—In the acute stage complete rest in bed on a fluid diet which should consist principally of citrated milk (1 to 2 gr. Sodium citrate to the oz. of milk). Drug treatment rests between Ipecacuanha and Emetine, while the former has the advantage of also containing the alkaloid Cephæline an adjunct to the Emetine, it has the drawback of requiring special preparation of the patient on account of the vomiting it causes. The total amount of Emetine given in a course should be regulated by the body weight and general condition, for example in a debilitated woman about 8 gr. No course should be more than 15 gr., and that only in very severe cases, the maximum usually being 12 gr. If necessary a shorter course may be given after a fortnight, but Emetine is a cumulative drug and liable to produce troublesome paralysis of muscles. The dose is generally 1 gr. daily intramuscularly or subcutaneously, with $\frac{1}{2}$ gr. by mouth with the object of destroying the amoeba in the lumen of the bowel.

In relapsing cases Emetine Bismuth Iodide 3 gr. daily in capsules for 12 days should follow a course of Emetine given intramuscularly. Stovarsol and Emetine Periodide have been recommended in resistant cyst passing cases. Bismuth Subnitrate is always useful and lately has been recommended in doses of 180 gr. in water every three hours. Yatren given as pills or an enema containing 2 to 6 gr. has been much lauded by some and by others found quite useless. Its disadvantages are its great cost and its powerful purgative action in many patients.

ARSENICAL PREPARATIONS IN THE TREATMENT OF AMOEBIC DYSENTERY.—Stovarsol was introduced by E. Marchoux, and is of value in resisting cases of amoebic dysentery in 4-grain doses in pill form once or twice a day, for not more than one week at a time, as it may produce a rash. It also has a tonic effect. Another non-toxic arsenical, Carbasone, has been very favourably reported on in 0.25 gramme (4 grain) doses, given twice a day in capsules for ten days. In resistant cases it may also be given in enemata of 2 grammes of the drug in 200 c.c. warm 1% solution of sodium bicarbonate, after a cleansing enema.

BACILLARY DYSENTERY.—The treatment differs widely in the Acute and Chronic forms.

ACUTE.—Diet fluids only albumen-water, rice-water, thin chicken or mutton broth, but no milk, later arrowroot, but in all cases increased with considerable caution. Medicinal—

R Sod. Sulph.	3j	Give every hour until the motions
Mag. Sulph.	3j	become fice, watery and fœculent,
Aquam ad.	3ss	without blood and mucus. Then every
		four hours for another day.

It is however important not to stop this saline treatment too quickly. This gives rapid relief by draining away the inflammatory œdema and so stopping the pain and straining.

Serum treatment is most important in severe early cases, but is of no avail in the chronic forms. The dose is 50 to 70 or even 100 c.c. If in 24 or 48 hours the temperature has not fallen and the toxic symptoms improved, repeat the dose. This is best given intramuscularly, but Rogers recommends that in collapsed and very toxic patients the serum should be added to a pint of hypertonic saline and given intravenously. There is no doubt that serum treatment has largely reduced the mortality. Not only does this relieve the collapse, but the excess of chlorides combining with the toxins enables them to be excreted in the urine. There is no question that serum treatment has largely reduced the mortality. *See also Specific Therapy.*

Intestinal disinfectants are not of much value, but Bismuth Salicylate and Kaolin may be tried, any constipating effect being avoided. The pain and straining may be so severe if not at once relieved by the saline, as to require Morphia and turpentine stupes to the abdomen.

CHRONIC BACILLARY DYSENTERY.—The condition of acute congestion of the mucous membrane has given place to extensive necrosis, and a prolonged period of treatment is now necessary for recovery.

Diet: Each patient must find out by experience what suits him best, but meat, alcohol, vegetables and all articles of food with spices and condiments must be excluded, but fruit juices should be freely given. Cold in all forms must be most carefully avoided, especially cold baths. The diet proved to be most suitable should be continued for many months. As regards medicinal treatment the ulcerated colon is directly acted on by enemata, drugs by the mouth having practically no effect with the exception of a small dose of Castor Oil in emulsion with Bismuth Subnitrate to remove irritating fœces. A variety of solutions have been recommended for the irrigation of the bowel, Silver Nitrate, Copper salts, Pot. Permang., Sod. Chloride, some

of these especially Silver Nitrate are painful and very ineffective in the presence of albumen and sodium chloride. Rogers therefore recommends either Albargin (silver albuminate) or Nargol (silver nucleate) in the strength of 1 gr. to the oz.

VACCINES.—Rogers has had success with sensitized Shiga vaccine in the relapsing carrier class of case, and Korbseh and Gross with intravenous injection every fifth day of doses of vaccine increasing from 5 to 60 M.

SURGICAL TREATMENT.—When all other measures have failed and the patient is losing ground, the only hope is to divert the faecal matter from the large bowel by surgical measures. Appendicostomy at one time largely used for irrigating the colon is now thought to be of little value. Cœcostomy is generally performed, but drainage must be continued for months; and long after the ulcers have healed as demonstrated by the sigmoidoscope.

DYSMENORRHŒA

There are two kinds (a) Congestive and (b) Spasmodic. Congestive Dysmenorrhœa is always associated with pelvic disease such as fixed retroflexion of the uterus or fibromyoma etc.; the pain is a constant pelvic ache and comes on a week before the period.

SPASMODIC DYSMENORRHŒA—is either congenital or begins within one or two years after the commencement of the menstrual life. The pain is cramp like, felt in the hypogastrium, over the sacrum and down the front of the thighs. The pain begins just before or with the onset of the menses and usually lasts a few hours. Between the periods in typical cases the patient is quite free.

TREATMENT.—These cases are frequently difficult to deal with the action of drugs being uncertain, some cases are cured by dilatation of the cervix, but in others fails entirely, as a last resort in very severe cases hysterectomy must be performed.

The following prescriptions should be tried:—

R Sodium Salicylate gr. 10 t.d.s. after meals for a week before each period. Or R Liq. Amm. Acet. ʒij given in the same way.

Antipyrin is very effective in many cases if given before the onset of the pain, 60 gr. should be given, 10 gr. every hour for three doses, and then every two hours for the remaining doses.

Guaiacum Resin 5 to 10 gr. in cachets t.d.s. begun 8 days before the period often entirely prevents the pain.

The following prescriptions are also useful:—

℞ Pot. Brom.	gr. 15	℞ Apiol crystals	gr. 2
Pot. Bicarb.	gr. 15	Pulv. Guaiaci	gr. 15
Spt. Aetheris Nit.	m 30		One cachet.
Tr. Capici	m 1½		
Tr. Chloroformi Co.	m 10	Taken just before the period is	
Syrup Zingib	m 5	expected.	
Aqua Menth. Pip. ad.	℥i		
Every 3 hours. Is useful in mild		℞ Pyramidon	gr. 5
cases.		Aspirin	gr. 10
			For one cachet.

It is important to keep the bowels well open, and to give an aperient three days before the period is expected.

DYSPEPSIA

In connection with this frequent disorder it is important to remember, that with many patients who complain of indigestion, the organ at fault is not the stomach, and secondly that there are many varieties of dyspepsia. Speaking generally the three chief symptoms are: (1) Vomiting; (2) Pain; and (3) Flatulence. It must be borne in mind that vomiting may be due to such conditions as uræmia, pregnancy, phthisis or cerebral disease; that pain is a symptom of gall-stones, pleurisy or chronic appendicitis etc.; and flatulence among other causes may be due to gall-stones or cardiac disease.

Finally when we have decided that the cause of the trouble is located in the stomach, we must decide as to whether it is functional or organic; if there is marked interference with the general health, if the pain is so severe as to make the patient stop work and rest, and the vomiting is persistent, the balance of evidence is strongly in favour of organic disease, and conversely in favour of a functional condition.

The general line of treatment should be directed to (1) To discovering the cause and correcting it; (2) To the selection of a diet including alcohol suitable to the impaired function of the stomach; (3) General hygienic measures such as regular exercise in the open air, careful attention to the teeth, meals taken at regular times and well masticated, smoking should be prohibited at first, and regular action of the bowels advised; (4) Proscribing such drugs as are known to correct the particular function impaired.

CHRONIC DYSPEPSIA.—Dr. Hurst lays stress on the following points:—

Successful treatment depends upon accurate diagnosis, the average duration of symptoms in his private patients with gastric

and duodenal ulcer when they first came under his care are ten years, and with carcinoma of the stomach it is twelve months. It is thus obvious that there is room for improvement in the diagnosis of chronic indigestion. There are three stages in the diagnosis, with sufficient care it is possible to make an accurate diagnosis in about 75 per cent. of cases, from consideration of the history, this is most important. The patient should give a full description of everything he does, and everything he eats and drinks, in an average day, and to describe in detail the nature, position, time of onset, exciting causes and manner of obtaining relief of every unpleasant sensation he experiences.

The second stage in investigating a case of indigestion is the physical examination, without which it is quite unjustifiable to make a diagnosis. Abdominal examination may show some localized muscular rigidity or an area of tenderness which suggests organic disease of the stomach, duodenum, gall-bladder, appendix or colon.

The third stage of investigation is by means of special methods radio-logical and bio-chemical, there is little to choose between them. The discovery of occult blood in the stools is as valuable a sign as the X-rays, it is present in all cases of carcinoma of the stomach and in a large majority of cases of chronic gastric and duodenal ulcer. The fractional test-meal is often very useful, it is the only means of recognizing achlorhydria, whether due to chronic gastritis or achylia gastrica, and it may be a great help in diagnosing carcinoma of the stomach, and in deciding upon the correct treatment in cases of ulcer. It is remarkable to find how often patients with achlorhydria have been treated for years for supposed hyperchlorhydria.

Indigestion is often caused by disease of other organs, whereas the frequency of appendix dyspepsia has been much exaggerated, gall-bladder dyspepsia Dr. Hurst believes is the most common cause of chronic indigestion.

Sthenic Dyspepsia (Excess of HCl)

℞ Bismuth Subnitras	gr. 25	℞ Liq. Bismuthi Amm. Cit.	3ij
Cerii Oxalat.	gr. 10	Syrup Pruni Virg.	3ij
One cachet t.d.s., after food.		Aquam ad.	3j
		t.d.s.	
℞ Liq. Bismuthi	3ss	℞ Pepsin	gr. 2
Acid Hydrocyanic Dil.	m 2	Liq. Bismuthi	m 15
Liq. Morph. Acet.	m 15	Tr. Nux Vom.	m 5
Spt. Amm. Aromat.	m 15	Tr. Card. Co.	m 30
Vin. Pepsini	3j	Spt. Chloroform	m 10
Inf. Aurantii Co. ad.	3j	Inf. Gent. Co.	3ss
t.d.s.		Aquam ad.	3j
		t.d.s.	

Asthenic Dyspepsia (Deficiency of HCl)

℞ Acid Hydrochlor. Dil.	℥ 25	℞ Pepsin	gr 2
Liq. Strychnine	℥ 5	Acid Nitro-Hydrochlor. Dil.	℥ 5
Glycerine Pepsin	3j	Tr. Nux Vom.	℥ 5
*Aqua Menth. Pip. ad.	3ss	Inf. Calumba ad.	3j
With water, t.d.s., immediately after food.			

The following drugs may also be added to this Mixture* :—

Liq. Ferri Perchlor.	Liq. Arsenic Hyd.
Liq. Morph. Hydrochlor.	Quinine Hydrochlor.

Dyspepsia of the Aged—

℞ Ferri Peptonati	gr. 3
Pancreatin	gr. 1
Strychnine	gr. 1/80

Flatulence and Painful Gastric Spasm—

℞ Spt. Amm. Aromat.	℥ 15
Spt. Aetheris Co.	℥ 8
Liq. Morph. Hydrochlor.	℥ 4
Aqua Menth. Pip. ad.	3ss

Painful Dyspepsia—

℞ Pulv. Capsici	gr. 1/2
Pil. Saponis Co.	gr. 3
Ol. Anthemidis	gr. 1/2

One pill after each meat meal.

Flatulent Dyspepsia with Dilated Stomach—

℞ Hydrarg. Perchlor.	gr. 1/24
Strychnine Sulph.	gr. 1/24
Creosoti	℥ 1 or 2

One pill before, between, or after meals.

Nervous Dyspepsia—

℞ Ferri Bromidi	gr. 1
Quinine Hydrobrom.	gr. 1
Ext. Rhei	gr. 1/2

One pill twice a day.

℞ Aq. Laurocerasi	3j
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Acid Eructations, Discomfort, and Flatulent Distension—

℞ Tr. Rhei	3j
Sod. Bicarb.	gr. 15
Mag. Carb.	gr. 10
Spt. Amm. Aromat.	3ss
Aqua Carui ad.	3iss

Taken occasionally.

Flatulent Dyspepsia—

℞ Tr. Cardamom Co.	℥ 20	℞ Sod. Bicarb.	gr. 15
Tr. Zingiberis	℥ 15	Spt. Amm. Aromat.	℥ 20
Spt. Amm. Aromat.	℥ 10	Spt. Armoracis Co.	℥ 20
Spt. Chloroform	℥ 10	Inf. Calumba ad.	3j
Acid Hydrocyanic Dil.	℥ 8	t.d.s.	
Aqua Carui ad.	3ss		

℞ Chloroformi	3j	℞ Menthol	gr. 1/2
Tr. Anisi	3ij	Calomel	gr. 1/2
Tr. Nux Vom.	3ij	Pulv. Ginger	gr. 2
Tr. Gentian	3ij	Maltine	q.s.

Ten to 20 drops in water 20 minutes before a meal.

One pill to be taken every quarter of an hour, until relieved.

Intestinal Flatulence—

R Oleum Cajuput	...	...	m 2
Ext. Gentian	...	...	q.s.
			One pill.

R Terebene, 10 to 15 m on a lump of sugar, or in capsule, t.d.s.

DYSPEPSIA IN CHILDREN

ACUTE.—Stop all food, if the vomiting continues after some hours, wash out the stomach. Then give Calomel, $\frac{1}{8}$ to $\frac{1}{4}$ gr. every three hours, until eight or ten doses have been given; then Bismuth in large doses.

CHRONIC.—This condition occurs in children, generally between the ages of five and eight. The following treatment is recommended by Hutchison. Careful attention to the diet, the limitation of carbohydrates, and almost complete exclusion of sugar. Change of air and a regular aperient.

R Pulv. Rhei	...	...	gr. 8
Sod. Bicarb.	...	...	gr. 10
Hydrarg. cum Creta	...	...	gr. 1 to 2

Every night, or, in milder cases, every second night.

With:—

R Pot. Bicarb.	...	...	gr. 5
Pot. Cit.	...	...	gr. 5
Tr. Nux Vom.	...	...	m 1
Inf. Gentian Co. ad.	...	...	3ij

In a little Water a quarter of an hour before meals.

See also Cœliac Disease, and article—Recent Advances in Medicine.

DYSPNŒA—See Croup, Cardiac and Pulmonary Disease.

EAR, AFFECTIONS OF—See Diseases of the Nose, Ear and Throat.

ECLAMPSIA—See Obstetrics.

ECTOPIC GESTATION, RUPTURE OF

SYMPTOMS.—Very sudden onset of acute pain in the lower abdomen, with severe shock and signs of internal hæmorrhage. Small feeble pulse, sighing respiration, sweating, sub-

normal temperature and increasing pallor. The patient and her friends may or may not be aware that she was pregnant.

There may be a history of colicky pains and slight irregular hæmorrhage, but the all-important fact is the sudden onset of the symptoms of internal hæmorrhage in an apparently perfectly healthy woman.

TREATMENT.—Immediate laparotomy, with patient in the Trendelenburg position, by a median incision below the umbilicus. The moment the peritonæum is opened, fluid and blood clot pour out, the uterus is quickly drawn up into the wound and the tube clamped. The hand is then passed over the tumour to the infundibulo pelvic ligament which is also clamped, this controls the hæmorrhage. Ligatures then replace the clamps and the tube is removed. The extravasated blood is sponged from the pelvis and flanks and the abdomen closed. Efforts to restore the patient from shock should be made while the operation is being completed.

The infusion of saline or transfusion of blood is necessary in practically all cases.

An extraperitoneal rupture occurs between the layers of the broad ligament, the onset is as sudden and pain severe, but not so much shock.

ECTROPION—*See* Diseases of the Eye.

ECZEMA

At least one-quarter of all eczemas are due to some external cause, and many are the result of the patient's occupation. The disease is now being studied for anaphylactic phenomena.

Diet plays an important part in treatment, the food being plain, nutritious, and easily digestible. Withholding all salt from the diet frequently has excellent results, especially in children; in other cases stopping sugar acts in the same way.

Deficient internal secretions should be compensated for by Organotherapy.

Among the tonics used are: Cod Liver Oil, Hypophosphites, Quinine, Nux Vomica, Iron, and the vegetable bitters; in gouty and rheumatic cases, Sodium Salicylate, Potassium Bicarbonate, Colchicum, Arsenic and Pot. Iodide.

ACUTE STAGE.—Externally.—Calamine Lotion applied on lint will relieve the irritation and smarting.

R Zinci Carb. (impure)	ʒij	R Calaminæ	ʒiv
Zinci Oxide	ʒj	Glycerine	ʒss
Glycerine	ʒss	Aqua Rosæ	ʒviij
Liq. Calcis q.s. ad.	ʒvj	(For the face.)	

R Lead Lotion or equal parts of Lead and Calamine Lotion
may be used for the extremities.

When the exudation has practically ceased, powders or ointments may be applied. Zinc Cream is a good application.

R Zinci Oxidi	ʒj	R Acidi Salicylici	gr. 10
Adipis Lanæ	ʒij	Amyli	ʒij
Olei Olivæ	ʒij	Zinci Oxidi	ʒij
Liquor Calcis	ʒij	Petrolati	ʒiv

*Acute Stage Past, but there is
Considerable Exudation*

Irritable and Congestive

R Zinci Oxidi	ʒij	R Emplastrum Plumbi and Paraffin	
Amyli	ʒij	Moll., equal parts.	
Vaseline	ʒss		

To this add either:—

Pustular Form

R Acidi Salicylici	gr. 10	R Hydrarg. Amm.	ʒj
Resorcin	gr. 10	Amyli	ʒij
or Ichthyol	gr. 30	Zinci Oxidi	ʒij
		Lanoline	ʒij

Seborrhæic Form

R Acid Pyrogallæ	gr. 25
Ung. Acidi Salicylici ad.	ʒj

Chronic Scaly Form—Gelatin Dressing.

R Gelatin	...	gr. 100	20 parts
Zinci Oxidi	...	gr. 60	12 parts
Ichthyol	...	gr. 21	2 parts
Glycerine	...	gr. 100	20 parts
Water	...	ʒivss	50 parts

Painted on with a brush and allowed to remain for 2 to 6 days.

Chronic Forms

R Liq. Carbon Deterg.	...	...	ʒj
Liq. Plumbi Fort.	...	...	ʒss
Hydrarg. Amm.	...	gr. 20	
Vaseline	...	...	ʒss
Lanoline	...	...	ʒss

Paint on the diseased patches and allow to dry.

Ointments of—

R Calomel	...	40 to 80 gr.	to ʒj
Salicylic Acid	...	20 to 60 gr.	to ʒj
Resorcin	...	20 to 60 gr.	to ʒj
Sulphur	...	10 to 60 gr.	to ʒj
Chrysarobin	} 1 to 10 per cent. made with Vaseline and painted on, followed by plentiful application of Zinc and Starch Powder.		
Pyrogallol			

IN CHILDREN.—The crusts should be removed by soaking with Boracic Starch, Poultices, prepared by mixing:—

℞ One teaspoonful of Boric Acid, and
One tablespoonful of Cold Water Starch, to a paste with Cold Water.
One pint Boiling Water is then added. This paste should be spread on cotton, covered with muslin, and changed frequently.

℞ Oleate Zinci ʒss
Cold Cream ʒj

Applied on strips of linen when stronger remedies cannot be borne.

℞ White Precipitate Ointment ... gr. ʒ to ʒj

Of the Head

℞ Hydrarg. Ammon. gr. 10
Liq. Carbonis Deterg. m 20
Lanoline ad. ʒj

Of the Vulva

℞ Liq. Plumbi Subacet. ʒss In more resistant cases, examine
to each pint of Water. urine for sugar and give Arsenic in-
Used as a compress, in the acute ternally.
stages.

℞ Pulv. Camphoræ	gr. 8	℞ Liq. Carbonis Deterg.	ʒj
Zinci Oxidi	ʒj	Hydrarg. Amm.	gr. 10
Adipis Benzoatis	ʒj	Lanolini	ʒj
Apply to the part.		Apply to the affected parts.	

ECZEMA OF THE MEATUS OF THE EAR—*See Diseases of the Ear.*

ELECTRICAL ACCIDENTS

Artificial respiration should be begun immediately and continued for at least four hours.

ELEPHANTIASIS—*See Filariasis.*

EMETINE TREATMENT

Revised by Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

May, 1934

One grain of Emetine is equivalent to 90 gr. of Ipecac.

A cheaper alternative for Emetine has been put on the market—'AMEBETINE'—which consists of the three known alkaloids of Ipecac, unseparated from each other.

It would appear that $\frac{1}{2}$ gr. dose daily is the maximum which can be given safely during pregnancy, only sufficient being given

to kill amœbæ in the stools, a complete cure being carried out after delivery.

If possible avoid Emetine during the menstrual period.

The oral administration of Emetine is not advisable, because of the intestinal irritation it induces. If the patient is to be treated by drugs, by the mouth, Ipecac should be employed.

The oral treatment of chronic cases with Emetine Bismuth Iodide may be of value, 3 gr. equal 1 gr. of Emetine Hydrochloride. Dose: 2 to 4 gr. daily in capsule, every night up to 12 doses, or full course 30 to 36 gr. It is claimed by some observers to be more efficient than Emetine Hydrochloride in removing cysts from the feces of carriers.

Large doses of Bismuth Subnitrate by the mouth unquestionably assist the hypodermic use of Emetine Hydrochloride in chronic and resisting cases. W. M. James and W. H. Deeks give 180 grains in a tumbler of water every three hours, night and day, and they find that relapses are comparatively rare.

Intravenous injections should be employed only in very acute cases. If this mode of administration seems imperative, $\frac{1}{2}$ gr. in 10 c.c. salt solution should be very slowly injected from a 10 c.c. syringe, and the blood-pressure carefully observed during the injection.

RELAPSES AFTER EMETINE.—Rogers believes that relapses are chiefly due to reliance solely on injections of emetine, and neglecting subsequent oral administration of Ipecac. to kill amœbæ free in the intestines, and so not reached by injections. He always gives 7 to 12 (usually 7 only) daily injections of emetine gr. 1 and followed up with 20 to 30 gr. of Ipecac. with 10 gr. Tannic Acid orally, given the last thing at night three hours after a light meal and continued for a week, it seldom causes sickness if given after a course of emetine injections. While in some cases of repeated relapse even after I.B.I., he gives the above course and follows it with 4 to 5 gr. Ipecac. with 2 gr. Tannic Acid, after getting into bed, and continued for a month or two longer, just as small doses of quinine are given to prevent relapses of malaria.

80 per cent. or more remain free from relapse, if treated for at least 7 days continuously, with not less than 1 gr. daily; if treated for less than 7 days, relapse is almost inevitable. In women the injections should precede the menstrual period by 4 or 5 days.

A case of amœbic dysentery inefficiently treated, with less than 7 gr. on Emetine, is likely to become highly dangerous as a carrier of cysts. One or two small doses may act beneficially

and get rid of active symptoms, such as the passage of blood and mucus, but it may at the same time stimulate the formation of cysts. The transmission of dysentery is undoubtedly due to the ingestion of cysts, conveyed by the contamination of food by fingers, flies or particles of sand carried by the wind. The resisting power of cysts outside the body is considerable.

THE TOXICITY OF EMETINE.—(1) The various commercial preparations differ widely in toxicity.

(2) When administered to animals intravenously in large doses, it is a powerful cardiac poison, causing at times fibrillation of the ventricles; it is also a circulatory and respiratory depressant.

(3) In fatally poisoned dogs, the characteristic lesion is a hæmorrhagic gastro-enteritis.

(4) The factors of blood coagulation are disturbed.

(5) There is no evidence of renal insufficiency.

(6) The lethal dose of Emetine for a man would appear to be about 15 gr.

(7) Weakness and atrophy of muscles of the neck and extremities may result from continued daily one grain injections of Emetine for over two weeks, so that two to three weeks' interval should be allowed after a course of 12 grains.

In the clinical use of Emetine, diarrhoea is an early manifestation of poisoning, followed by great depression, altered coagulability of the blood, and muscular paralysis.

EMETINE HAS BEEN GIVEN IN THE FOLLOWING CONDITIONS:—

(1) Amoebic Dysentery.

(2) Bacillary Dysentery. Emetine is quite useless, and does harm by increasing the number of stools.

(3) Dysentery due to *Balantidium Coli*. A rare and very fatal disease of Southern Europe, United States and the East. In this disorder Emetine is worthy of a trial.

(4) Sprue. Rogers now considers Emetine useless in this disease.

(5) Chronic Diarrhoea. Rogers found half the fatal cases of amoebic dysentery in Calcutta had been diagnosed as 'chronic diarrhoea' and 'tuberculous diarrhoea', and showed in the under-mentioned Lettsomian lectures, that the relationship of diarrhoea in the British Army in India to hepatitis is exactly the same as

that of dysentery itself, so he is sure that most cases diagnosed as chronic diarrhoea and tuberculous diarrhoea, are really amoebic dysentery or colitis requiring emetine, he does not believe that Emetine is of much use in true tubercular diarrhoea.

(6) Cholera. Rogers concludes, that it has no influence for good or evil on the course of the disease when the hypertonic saline treatment is also employed.

(7) Amoebic Hepatitis. Emetine injections prevent the formation of liver abscess, while if an abscess has already formed, only aspiration and continued Emetine injections are necessary to cure it. Rogers has proved that even small multiple liver abscesses, seen at an abdominal operation, cleared up completely with permanent recovery under Emetine. REFERENCE; Rogers, Lettsomian Lectures, *Lancet*, 1922, 1. The treatment must be persisted with for longer periods than is usually necessary in amoebic dysentery. Repeated leucocyte counts are necessary. If they show a steady decrease, the Emetine should be continued, until no excess of white corpuscles remains; if, however, leucocytosis persists, in spite of prolonged Emetine treatment, it is exceedingly probable that suppuration has already taken place. Small abscesses may encyst under Emetine and not require aspiration. Deaths from liver abscess have thus been practically abolished in the British Army in India.

(8) Hepato-Pulmonary Abscess has been successfully treated.

(9) Intestinal Hæmorrhage due to typhoid, paratyphoid, alcoholic cirrhosis, malignant disease, tubercular ulceration, uræmic ulceration, and ulcerative entero-colitis. $\frac{1}{2}$ gr. doses are usually sufficient.

(10) Hæmoptysis, tuberculosis of the lungs, bronchopneumonia in the aged, asthma, acute and chronic bronchitis. In the last two conditions it has been strongly advocated by the French schools, in small doses, to make the expectoration more fluid.

(11) Pyorrhœa Alveolaris. The opinion of American workers that pyorrhœa is due to a buccal amoeba, is exploded, and Emetine is of very doubtful value in this trouble.

(12) Hæmorrhage following naso-pharyngeal operations.

EMISSIONS, NOCTURNAL

These are physiological and should only be treated if they are caused by a posterior urethritis or phimosis. Constipation if present should be treated, the patient reassured and his atten-

tion diverted from his sexual organs by exercise in the open air. The habit may sometimes be broken by giving R Sod. Bromide gr. 30 with Tr. Opii. m 7 just before bed time for 4 or 5 nights.

EMPHYSEMA OF THE LUNGS

Treatment in the first place should be preventive by stopping the recurrent acute attacks in a case of chronic bronchitis. Climate is an important factor, it should be warm and moist, free from wind and more especially from dust. The condition while it may be arrested cannot be cured, but is considerably benefited in many cases by Potassium Iodide which may be given in one of the following prescriptions:—

R Pot. Iodide	gr. 5	R Pot. Iodide	gr. 2
Pot. Bicarb.	gr. 15	Liq. Aësenicæ	m 2
Anim. Carb.	gr. 3	Tr. Nux Vom.	m 2
Aqua Camph. ad.	℥j	Inf. Gentian Co. ad.	℥j
t.d.s.p.c.		t.d.s.p.c.	

The Potassium Iodide is gradually increased.

EMPHYSEMA, SURGICAL

From laceration of the pleura and lung, while causing discomfort is not in itself a serious complication although it may spread as far as the wrist and ankles, causing a fine crackling under the skin.

EMPHYSEMA

The treatment of this has undergone important changes in recent years, it is imperative to consider the nature of the organism causing the empyema, and the condition of the lung itself. The three common infecting organisms are the streptococcus, the pneumococcus and the tubercle bacillus. The first forms a thin serious effusion and adhesions take a long time to form, aspirations should therefore be carried out for a period of from two to four weeks, until it is probable that adhesions have formed. In the pneumococcal empyemas adhesions form early and the pus is thick, but aspirations should be carried out from 7 to 10 days, and open operation should not be undertaken until the underlying lung has become expansile. In tuberculous empyoma, unless the patient has a high temperature and his general condition is suffering, it is best to leave the condition alone, the all important point being to prevent a secondary infection with pyogenic organisms.

The open operation can be performed, as a rule, under local anæsthesia (1 per cent. Novocain), a vertical incision is made in the axillary line or posteriorly near the angle of the ribs. A rib is cut down on and divided subperiosteally, about $1\frac{1}{2}$ inches

being removed. Irrigation of the cavity by Carrel-Dakin fluid may be used, but to avoid danger there must be the freest drainage. Maintenance of negative pressure is of considerable aid to expansion of the lung.

It is important to bear in mind that infants under two years do not stand the open operation well, even if the empyema is localized, and intercostal drainage is generally satisfactory.

If the above treatment is carried out chronic empyema will be rare, and when it occurs will generally be found associated with a bronchial fistula. Chronic empyema should be treated in the same way as long as the lung continues to expand, but when this expansion comes to a stand still decortication or collapse of the chest wall to the contracted lung will be required.

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EMPYEMA, SUB-DIAPHRAGMATIC—See Complications and Sequelæ of Operations.

ENCEPHALITIS LETHARGICA OR EPIDEMIC

No specific treatment is known, absolute rest and good nursing are essential. Possibly the most success has attended the use intravenously of 30 c.c. of a 2½ per cent. pure sodium salicylate twice daily, by the mouth it is quite useless. Hexamine has been used in the same way. Fixation abscesses to divert the toxin are in much favour in France. Serum-therapy has not been satisfactory, but lumbar puncture is useful for excitement and restlessness.

ENCEPHALITIS, POST-VACCINAL—See Vaccination.

ENDOCARDITIS, INFECTIVE (MALIGNANT)

The methods of treatment are:—

1. Anti-bacterial sera such as that prepared by Messrs. Burrough's and Wellcome in 25 c.c. doses.

2. Autogenous vaccines. Search should be made for a septic focus, if found, it should be eliminated, and the organism compared with that isolated by a blood culture, the blood being taken during a febrile period.
3. Immuno-transfusion of blood.
4. Intravenous injection of bactericidal drugs.

ENDOMETRITIS, CHRONIC

This is a term which is now seldom used, as the state of the uterus is attributable to normal uterine and ovarian action.

ENTERIC

This is a septicæmia, the bacillus being present in the blood stream from which it can be cultivated during the first eight days of the illness before the Widal reaction.

The severity of the disease varies greatly both in individual cases and in epidemics. There is wide spread infectivity as the organism can be isolated from the urine, stools, bile, vomit, sputum and pus from abscesses, this shows that care should be exercised as to disinfection, in handling the patient and all utensils used in nursing.

As regards treatment nursing is of the first importance and absolute rest lying down is essential, typhoid patients stand very badly any form of transportation or movement. Careful attention must be paid to the cleanliness of the skin, mouth and fauces.

On the subject of diet there are two schools, one holding that a liquid diet is absolutely essential, the other advocating a liberal diet to increase the resistance and lessen the liability to hæmorrhage and perforation; on the other hand food undigested and unabsorbed will cause dangerous meteorism and diarrhoea. Common sense must guide the doctor in each individual case, as a patient with profound toxæmia and high temperature has little power of digestion.

Milk should be the basis in all severe cases up to three pints in the 24 hours, divided into two-hourly feeds of 5 ozs. each, the milk may be diluted or flavoured with tea or coffee. Water must be taken in considerable quantity between feeds, or orange juice or still lemonade. When there is constipation this should be corrected by giving beef-tea. If the stools show undigested particles or curds, the milk should be citrated by adding Sodium citrate 1 to 2 gr. to the ounce. When additional carbo-

hydrates are required Dextro-maltose may be added to each feed, or extra calories by adding 1 to 1½ ozs. of cream in the 24 hours.

After the temperature has fallen to normal the patient should be kept recumbent for 14 days, and no addition made to the diet for 7 days, overfeeding is a frequent cause of return of the fever and a relapse.

There is no specific drug treatment, serum or vaccine therapy either intravenous or subcutaneous have no direct effect.

Hydrotherapy in the form of sponging and wet packs is useful in some cases, especially in cases with prolonged pyrexia over 103°, but the bath involves so much disturbance of the patient that this is not compensated for by reduction in temperature. It has been claimed for Hydrotherapy that it stimulates the circulation with a fall in the pulse rate, that there are fewer nervous symptoms such as delirium and tremors, a reduction in the temperature with increased excretion of toxins by the kidneys, there is less liability to bed-sores, and the initial bronchitis is diminished, and finally that the death rate is reduced. It is contra-indicated in great prostration, hæmorrhage, peritonitis and phlebitis.

Quinine and Nascent Chlorine mixture every 4 hours has claimed for it a shorter course of the disease, a lower temperature and an improved general condition.

TREATMENT OF COMPLICATIONS.—

MYOCARDIAL WEAKNESS.—As shown by rising pulse rate, displacement outwards of the apex beat and alteration of the first sound. Give Camphor in oil 2 to 3 gr. hypodermically.

TOXÆMIA.—Give Brandy or Whisky up to 4 ozs. in the 24 hours.

VOMITING.—This is only common in Para-typhoid B., give iced champagne.

TYMPANITES—is probably due to unsuitable diet-stop food. Give a turpentine or asafoetida enema or pass the rectal tube.

Enemas

R Pure Turpentine	℥j	℞ Tr. Asafoetida	℥ij
Thin boiled Starch Mucilage	℥xij	Mucilage starch	℥iv

In extreme cases pass the stomach tube. Resume feeding with care commencing with albumen water and whey.

HÆMORRHAGE.—Iced water only by mouth. An immediate injection of Morph. ¼ gr., Calcium Chloride 1 gr. in 100 m.

sterile water intramuscularly. Or Hæmoplastin 2 c.c. subcutaneously. Drugs by the mouth have apparently little effect, but the following may be tried:—

<i>Mixture</i>		<i>Enema</i>	
R Acidi Tannici	gr. 10	R Tannin	gr. 10
Tr. Opii	℥ 10	Pulv. Ipecac Co.	gr. 12
Spt. Turpentine	℥ 15	Mucilage	℥j
Tr. Chloroformi Co.	℥ 15	Starch	℥j
Mucilage	℥j		
Aqua Menth. Pip. ad.	℥j		
Every two hours.			

CONSTIPATION.—Beef-tea, or grape-juice, begin with the juice of 15 grapes. Glycerine or cold water enemas. A small dose of Castor Oil.

DIARRHŒA.—Careful attention to the diet. R Pil. Plumbi cum Opio. Gr. 2 to 4 or an Enema of R Tr. Opii. ℥ 30 with thin cold Starch Mucilage ℥j.

PERFORATION.—Immediate laparotomy in some cases gives brilliant results, but the operation must be completed rapidly.

BED-SORES.—Apply a mixture of R Tr. Benzoin ℥j, Castor Oil ℥j.

SLEEPLESSNESS AND DELIRIUM.—Sponging and Pulv. Ipecac. Co. gr. 12.

FEMORAL THROMBOSIS.—Absolute immobility of the leg and thigh, with the application of Glycerine of Belladonna.

CONVALESCENCE.—In severe cases this is prolonged, and in India a year's leave Home is generally essential.

PROPHYLAXIS.—By combined typhoid and para-typhoid vaccine is very effective, probable immunity is for 2 years, with partial protection for another 2 years.

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ENTROPION—*See* Disease of the Eye.

ENURESIS IN CHILDREN

This is an indication of general nervous irritability. It is essential to cultivate confidence in the child to overcome the disability. Large doses of Belladonna will give temporary relief, which should be used to recapture the necessary self-confidence. In cases with hypothyroidism thyroid extract is effective. In cases of Nocturnal Epilepsy with Enuresis give R Sod. Bromide gr. 20, Tr. Belladonna m 10 to 15, as a single dose at bedtime.

EPIDIDYMO-ORCHITIS

The most frequent cause is Gonorrhœa also Acute tuberculosis, B. Coli infection, subacute torsion of the spermatic cord and thrombosis of the veins of the pampiniform plexus.

TREATMENT.—The patient should be kept in bed with the scrotum well raised on a soft pillow. Apply Lotio Plumbi Evaporans on lint or if the pain is severe hot boracic fomentations. Give a good dose of Calomel followed by a saline. Oleum Santal Flav. should be given internally. The following local applications have proved useful in many cases:—

R Guaiacol (20%)	ʒiv	R Ichthyolis	ʒi
Lanoline	ʒiv	Lanoline	ʒss
Resorcin	ʒiv	Vaseline	ʒss
Make an ointment. Apply by spreading on lint, and covering with oiled silk.		To be constantly applied on lint.	

Sub-acute and Chronic Cases

R Ung. Potassi Iodidi	ʒij	R Ung. Belladonna	ʒiv
Ichthyol	ʒij	Ung. Hydrarg.	ʒiv
Adeps Lanæ Hydros	ʒiv	Ichthyol	ʒv
Apply freely twice a day.		Petrolati q.s. ad.	ʒij
		Apply daily to the scrotum, and support with a suspensory bandage.	

In acute tubercular cases the hope of saving the testicle is so small that castration should be advised directly the diagnosis is made.

EPILEPSY

The condition has been divided into Organic in which a definite cerebral lesion is present, and Idiopathic in which no gross cerebral lesion is to be found. The fit may be severe grand mal or slight petit mal, but most epileptics suffer from both.

Cases of grand mal only are the most favourable, and petit mal alone are the least favourable from the point of prognosis.

It is usually impossible to avert an impending attack, for treatment place the patient recumbent, loosen the clothes around the neck, and protect the tongue from being bitten by a piece of wood between the teeth.

As regards general treatment several systems of diet have been tried without much benefit, the one article that must be forbidden is alcohol. Recently a diet calculated to produce Ketosis, which is judged by Acetone bodies in the urine has been tried especially in children, but is still in the experimental stage.

Medicinal treatment is the most important, Bromides and Luminal holding the first place, some consider that Ammonium or Stontium salts have an advantage over Potassium and Sodium but this has not been proved. The all essential point in the treatment by Bromides is that it should be continuous and prolonged, being continued for at least two years after the last attack. Patients must always be warned of the possible grave results of suddenly stopping treatment, *e.g.* Status Epilepticus. The dosage must be determined by the severity of the case, but it is seldom necessary to give more than 60 gr. daily; the object is to arrest the attacks and the dose should not be larger than is necessary to effect this object.

Luminal may be used as an alternative or in combination with the Bromides, it is very effective in nocturnal epilepsy and petit mal, and is valuable in patients who cannot take Bromides on account of acne. The dose is 1 to 1½ gr. morning and evening. Its disadvantages are that tolerance may be rapidly acquired, in some persons it has marked toxic effects, it is difficult to withdraw without recurrence of attacks and is more expensive.

Other drugs that may prove useful are Zinc salts of which the best is the Lactate gr. 2 to 5 t.d.s. Biborate of Sodium 10 gr. t.d.s., its action appears to enhance the Bromides. Belladonna combined with Bromides is sometimes especially valuable in the treatment of children.

Colony or Mental Hospital treatment is indicated in patients with low mentality or with frequent and severe attacks.

Treatment of the Status Epilepticus requires urgent measures, control the convulsions with chloroform inhalation giving at the same time Hyoscine Hydrobromide gr. 1/100 to 1/50 or Morphia gr. ¼. Then empty the lower bowel. Alternative treatment is Paraldehyde ʒiv by mouth, or ʒvj to ʒviij per rectum with an equal quantity of olive oil. Or Sodium

Luminal hypodermically $\frac{1}{2}$ gr. followed by 1 gr. if the convulsions are not controlled.

The following prescriptions have all proved useful:—

R Sodium Bromide	gr. 15 to 20	R Pot. Bromide	gr. 15 to 20
Liq. Arsenicalis	m 2	Antipyrin or Phenazone	gr. 10
Tr. Nux Vom.	m 2	Syrup Aurantii	3j
Inf. Aurantii Co. ad.	3j	Aqua Chloroformi ad.	3j
		t.d.s.	

R Luminal	1 to 1½ gr.	R Strontii Bromide	gr. 10
Morning and evening in tablet, powder or cachet.		Sodium Bromide	gr. 10
		Sodium Biborate	gr. 10
		Syrup Glycerophosphate Co.	3j
		Aqua Chloroformi ad.	3j
		t.d.s.	

R Sodium Luminal.—Is not stable in solution, but can be given hypo- dermically in a solution made with freshly prepared distilled water, not exceeding 10 per cent. in strength. Dose $\frac{1}{2}$ to 2 gr.	R Potassium Bromide	gr. 15
	Zinc Lactate	gr. 4
	Syrup Auranti	3j
	Aqua Chloroformi ad.	3j

For Children

R Sodium Bromide	gr. 10	R Liq. Atropinæ Sulph.	m 1 to 2
Tr. Belladonna	m 5 to 10	t.d.s.	
t.d.s.			

EPISTAXIS

It is important to consider the causes, this may be local as trauma, or general such as atheroma, high blood pressure, valvular or Bright's disease, cirrhosis of the liver, blood conditions such as anæmias, leucæmia, purpura and scurvy. Acute infections particularly enteric, rheumatic fever and influenza.

It is frequently beneficial, as for example acting as a safety valve in high blood pressure, and possibly saving the patient from cerebral hæmorrhage in such cases it does not require treatment beyond a saline purge. If the bleeding is excessive the patient should lie down with the head raised, sponge the face with cold water and put a cold compress across the bridge of nose which should be held tightly between the fore-finger and thumb. If this does not control syringe with a strong solution of Hydrogen Peroxide.

Still failing, if bleeding is coming from the most usual spot the anterior part of the septum, apply the galvanic cautery, or if not available, then apply Silver Nitrate a small bead fused on the end of a probe, or the anterior part of the nose may be plugged with sterile gauze soaked in Adrenalin Solution.

If there is no indication of the source of the bleeding the whole nasal cavity must be plugged, for this if Howard's nasal bag is not available, then use narrow packing gauze introduced with angular nasal forceps, which must however be removed at the end of 24 hours. If the hæmorrhage tends to recur inject Hæmoplastin.

ERYSIPELAS

The urine should at once be examined for sugar and albumen, as this condition is more liable to occur in those whose general health is undermined. Give a brisk Calomel and Saline purge. Locally in the milder forms apply Lotio. Plumbi. cum Opio., or an antiseptic as Carbolic 1 in 60, or Ichthyol 10% in Glycerine on lint.

In the severer forms apply weak Tr. Iodi. or strong Silver Nitrate solution an inch from the sharply defined edge, with the object of producing a leucocytosis barrier to stop the spread. Incisions may have to be free and numerous with moist antiseptic dressings.

Give Anti-erysipelas serum 20 to 30 c.c. intramuscularly, the case should be isolated. Drugs internally including the Tr. Ferri Chlor. are useless.

ETHMOIDITIS—*See Diseases of the Nose. Accessory Sinuses.*

EXOPHTHALMIC GOITRE—*See Goitre.*

EXTRAVASATION OF URINE

This is generally the result of the rupture of a distended urethra behind a neglected stricture, or may be due to traumatic rupture of the urethra. The urine, which is generally very foul and alkaline, sets up a gangrenous cellulitis.

The object of treatment is to re-establish the urethral canal, and to prevent the sloughing of the skin and subcutaneous tissues by early operation, by free deep incisions, allowing the extravasated urine and pus to escape.

The patient being in the lithotomy position, a deep incision is made in the median line of the perineum so as to divide the stricture and open the urethra behind the stricture. Incisions about 8 inches in length, are freely made into the cedematous tissues of penis, scrotum and perineum, to allow the extravasated urine to escape, and further extravasation is prevented by a tube introduced into the bladder through the opened urethra. The wounds should be dressed with gauze soaked in Eusol or Hypertonic Saline.

EYE, WOUNDS OF—*See Diseases of the Eye.*

EYELIDS, DISEASES OF—*See Diseases of the Eye.*

FACIAL PARALYSIS

Treatment will depend upon the cause, syphilitic cases require Mercury and Pot. Iodide, if due to a wound primary suture must be performed. In fractures of the base of the skull little can be done at first, if due to suppuration of the middle ear prompt measures must be taken to prevent total destruction of the nerve.

The majority of cases however are due to what is called the 'rheumatic' variety, which have an onset with acute pain and are best treated with a dose of Calomel, Sod. Salicylate, and Phenazone.

R Sod. Salicylate	...	...	gr. 5
Phenazone	...	...	gr. 5
Syrup Ginger	...	...	ʒi
Aqua Chloroformi ad.	...	...	ʒss

Every half hour for three or four doses.

Later Strychnine, vibratory Massage and Electricity by the continuous current, applied several times a day for 15 minutes at each sitting. Stretching of the paralysed muscles should be prevented by correcting the deformity of the mouth by a loop of metal in the angle of the mouth attached around the ear.

In those cases which are principally due to trauma or otitis media, which show no signs of recovery after six months should have facio-hypoglossal anastomosis performed.

FACIAL SPASM

In early cases change of air, massage and sedatives, later if this fails the affected branch should be injected with 3 to 4 drops of 90 per cent. alcohol which gives freedom for six months.

FAVUS—*See Tinea Favosa.*

FEVERS OF UNKNOWN ORIGIN

The following prescriptions have at times all been useful in obscure pyrexias:—

R Sod. Salicylate	gr. 10	R Sod. Salicylate	gr. 10
Pot. Cit.	gr. 20 to 30	Antipyrin	gr. 5
Quin. Sulph.	gr. 1	Sp. Arom. Aromat.	ʒ 15
Syrup Auranti	ʒ 30	Tr. Auranti	ʒ 10
Aqua Chloroformi ad.	ʒi	Aqua Chloroformi ad.	ʒi
Every 4 hours.		Every 4 hours.	

℞ Tr. Quin. Amm.	5j	℞ Quin. Sulph.	gr. 5
Liq. Amm. Acet.	5ij	Tr. Digitalis	m 10
Tr. Camph. Co.	3ss	Acid Phosph. Dil.	m 15
Amm. Carb.	gr. 2	Aquam ad.	3j
Aqua Month. Pip. ad.	3ss	Every 4 to 6 hours.	
(Broadbent's mixture)			
Every 4 hours.			
℞ Pot. Cit.	gr. 20	℞ Pulv. Antimonialis	gr. 1
Aspirin	gr. 10	Quinine Sulph.	gr. 2
Aquam ad.	3ss	Ext. Conium	gr. 2
Every 4 hours.			

FIBROIDS OF THE UTERUS

These are very frequent tumours, 40 per cent. of all women suffer from them. The two chief symptoms are menstrual bleeding and pressure symptoms. As regards treatment drugs such as ergot are useless. The use of X-rays aims at producing an artificial menopause the results of which are often disagreeable, and the treatment of hæmorrhage by the intra-uterine application of Radium is disappointing. Treatment therefore is surgical, and is either abdominal myomectomy if it is desired to leave a child bearing organ; or hysterectomy which may be supravaginal or total, the latter is usually advisable as the cervix in these cases appears to be predisposed to carcinoma.

FIBROSITIS

Occurs wherever fibrous tissue is found, in the body-ligaments, tendons, muscles, fasciæ, aponeuroses and nerve sheaths. Giving rise to peri-articular arthritis, tenosynovitis, lumbago, perineuritis, sciatica and brachial neuritis. It is the result of toxins in the blood stream of two distinct kinds; infective or bacterial, and metabolic or chemical. Treatment resolves itself into the discovery of the cause and removal of the pain.

The common seats of focal sepsis are:—

- | | |
|----------------------------|----------------------|
| 1. Teeth. | 6. Appendix. |
| 2. Tonsils. | 7. Gall-bladder. |
| 3. Naso-pharynx. | 8. Intestinal Tract. |
| 4. Nose and Nasal Sinuses. | 9. Bronchial Tract. |
| 5. Genito-urinary Tract. | 10. Ears. |

METABOLIC CAUSES ARE:—Toxins of metabolism from faulty digestion, unsuitable articles of diet, Sugar and Starch in some people, Protein and Alcohol in others. Other causes are cold, damp, trauma and excessive exercise in sedentary persons.

TREATMENT OF ACUTE FIBROSITIS.—A good dose of Calomel followed by a Saline next morning. Complete rest in bed. Light diet. Analgesics such as:—

R Asphin	gr. 4	or R Pyramidon	gr. 6
Phenacetin	gr. 4	Aspirin	gr. 6
Codeine	gr. $\frac{1}{4}$	Quinine Salicylate	gr. $1\frac{1}{4}$
Caffein	gr. $\frac{1}{4}$	Codeine	gr. $\frac{1}{4}$

One cachet every four hours until the pain is relieved.

or R Sodium Salicylate	gr. 20 to 30	R Pulv. Doveri	gr. 15
Sodium Citrate	gr. 20 to 30	At bed-time if Aspirin and Salicylates fail.	
In a tumbler of hot water 4 times daily for two days.			

LOCALLY.—Heat in the form of Antiphlogistine, mustard or linseed poultices, hot bottles, electrically heated pads, and radiant heat by hand lamp or bath. Diathermy is most effective, but the patient must be in bed.

OTHER MEASURES ARE:—Dry cupping, Acupuncture after injection of 1% Novocaine over a fairly large area will sometimes give immediate relief, and Colon irrigation. Almost instantaneous relief is given by the deep injection of Quinine Urea Hydrochloride 1%, 3 to 5 c.c., the anaesthesia lasts for some hours and gives time for other measures to take effect. Massage should only be employed after the acute stage has subsided and then at first very gently and lightly.

TREATMENT OF CHRONIC FIBROSITIS.—This resolves itself into the removal of septic foci and Vaccine Therapy. The treatment of metabolic irregularities by less food, more exercise, the minimum of tea, coffee, tobacco and alcohol and drinking plenty of water. In some cases a complete alteration of the diet to which the patient has been accustomed will at times work wonders. Radiant heat, hot or mud baths or diathermy, followed at once by massage. As regards drugs Iodine in the form of Lugol's solution 5 to 10 m twice daily, continued over several weeks probably gives the best results.

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FILARIASIS

Medicinal treatment is of no value as no drug will destroy the filaria within the body. The recurrent attacks of lymphan-

gitis which cause the elephantie enlargement of the legs can be checked by the use of autogenous vaccines of streptococci or staphylococci in doses of 100 to 200 M. Much can be done in the early stages of Elephantiasis of the limbs by well adjusted pressure to prevent enlargement, but the many and varied surgical measures have met with little success, if scrotal or labial tumours are removed enlargement of the legs is liable to follow.

FINGER CRACKS

Fill with aseptic wax or carefully seal with collodium.

FISSURE, ANAL—*See Anal Fissure.*

FLATULENCE

In neurotic subjects, in mouth breathers, in adenoids and deviation of the septum it is due to swallowing air. The patient should take small dry meals and drink between, not at meals.

The following prescriptions have proved useful:—

R Sp. Amm. Aromat	m 25	or R Menthol	gr. $\frac{1}{2}$
Sp. Chloroformi	m 15	Sp. Amm. Aromat	3j
Sp. Menth. Pip.	m 12	Sp. Chloroformi	3j
Sp. Cajuput	m 8	One teaspoonful in water when	
To be taken in a wineglass of water		required.	
whenever the flatulence is			
troublesome.			

Flatulenco with Painful Gastric Spasm

R Sp. Amm. Aromat	m 15
Sp. Aetheris Co.	m 8
Liq. Morph. Hydrochlor.	m 4
Aqua Menth. Pip. ad.	3ss

Flatulenco with Dilated Stomach

R Hydrag. Perchlor.	gr. 1/24
Strychnine Sulph.	gr. 1/24
Creosoti	m 1 to 2
One pill before, between or after	
meals.	

Intestinal Flatulence

R Menthol	gr. $\frac{1}{4}$	R Terabene 10 to 15 m on sugar or	
Ext. Belladonna	gr. $\frac{1}{4}$	in capsule.	
One pill t.d.s.		R Charcoal	3j
		t.d.s.	

FOOD POISONING

May be due to a variety of causes, thus the animal or plant composing the food may be poisonous, as in the case of certain tropical fish, mushrooms and ergot. The food may be poisoned by chemical substances such as lead, arsenic, copper, etc.; this may be result of accident as lead from pipes, impurities as

Arsenic in sweets and beer, etc., and copper in erosion of cooking pots. These types are however small in number as compared with outbreaks due to infection of food with pathogenic bacteria, of which three quarters of all outbreaks belong to the Salmonella group of bacteria. The infection may occur in almost any kind of food such as canned foods, milk and milk products, meats, fruit and vegetables, it however in the great majority of cases occurs in foods which have been handled and made up. It must here be emphasized that such a thing as Ptomaine Poisoning does not exist, the advanced decomposition of food necessary to produce ptomaines would make the food too unpleasant to eat, while food poisoned with the Salmonella bacilli is normal to taste, smell and look. The symptoms are violent vomiting, diarrhoea and abdominal pain with cramps and collapse. In the more severe cases the mortality is under 2%.

TREATMENT.—Complete rest in bed, with hot applications to the abdomen. Stop all food and liquids, if there is much pain without collapse give a hypodermic of Morphia. In a case of moderate severity give a dose of Castor Oil in the following form:—

R Oleum Ricini	ʒvj	R Bismuth Carb.	gr. 20
Sp. Vini Gallici	ʒij	Acid Hydrocyanic Dil.	℥ 4
Tr. Opii.	℥ 10	Liq. Morph. Hyd.	℥ 10
Aqua Cinnam. ad.	ʒiiss	Pulv. Acaciae	gr. 8
Followed by—		Aqua Chloroformi. ad.	ʒj
		Every four hours.	

When feeding is recommenced give first sips of water, then albumen water, whey, chicken or veal broth 3 or 4 ozs. every 2 hours, to which Brandy may be added. Then citrated, peptonized and ordinary milk, and so to the ordinary diet.

BOTULISM.—These toxins which act especially on the nervous system are extremely powerful and the mortality very high.

TREATMENT.—The specific antitoxic serum if obtainable should be given as early as possible, intravenously. Stimulants should be given freely especially alcohol, elimination by sweating and washing out the colon.

FOREIGN BODIES IN THE AIR PASSAGES AND ŒSOPHAGUS—See Air Passages and Œsophagus, Foreign Bodies in.

FRACTURES

May be divided into Traumatic when the result of injury and Pathological when the result of disease of the bone. Clini-

cal diagnosis should always be made from the symptoms of pain, local swelling and tenderness, undue mobility, deformity, loss of function and crepitus. Reduction by manipulation, gradual extension or open operation immediately proceeded with. But X-ray examination should invariably be made as soon as possible, and again after reduction, and is of further use in checking the progress of union. Two plates should be taken in different planes, if possible at right angles to one another, as a fracture which may not show in an antero-posterior plane may be quite obvious in a lateral view. Screen examination alone is utterly useless. In all doubtful cases the sound limb should be X-rayed and compared with the injured limb.

The methods of treatment can be grouped under three heads:—

1. **PROTECTIVE.**—In this the natural processes of repair are aided after reduction, by retaining the ends of the bones in good position by bandages, slings, or splints of wood, metal or plaster, but avoiding any prolonged fixation, and allowing natural movements as soon as possible, and massage.

2. **MECHANICAL OR TRACTION.**—Attachment is made to the distal side of the fracture by adhesive materials, transfixion or ice tong calipers, by which the contraction of the muscles which makes the ends of the bones overlap is overcome; this method causes the least interference with natural repair and the quickest functional recovery.

3. **OPERATIVE.**—The open method by which the fracture is reduced and then fixed by impaction, encircling suture of wire etc., nails or pegs, plating or grafting, no one method being suitable for all cases.

The method involves risk, but should be adopted in skilled hands if other methods have failed to reduce the fracture to correct anatomical position.

For the treatment of the fractures of special bones reference must be made to books on General Surgery.

FRACTURES, COMPOUND

A compound fracture always requires operation and is a surgical emergency of the first importance, and is one in which the surgeon, by immediate action, can prevent infection, thereby saving his patient from weeks of suppuration, non-union of the bone, amputation or even death.

The following steps should be taken:—

1. When first seen, paint the wound with Iodine 2 per cent. in rectified spirit and apply a sterile dressing.

2. The patient is prepared for operation, and the splints etc., required for the fracture are decided upon and prepared to avoid delay under anaesthesia.
3. A careful examination is made as to the possibility of any nerve injury, by testing the patient's voluntary movements and sensation, as these cannot be discovered under anaesthesia.
4. Under anaesthesia the whole limb must be carefully cleansed, dry shaved and painted with 2 per cent. Iodine solution.
5. The aseptic towels, gowns and gloves having been changed, the wound is enlarged if necessary, the margins excised, and all particles of dirt and blood clot are removed, and badly damaged tissue excised.
6. The ends of the bone are cleansed and reduced, and if comminuted, all fragments not attached by periosteum removed.
7. The surgeon must use his own ingenuity as to keeping the bones in position, no one splint is suitable for all cases. Skeleton splints of the Thomas type are especially useful, as they permit the wound to be dressed without disturbing the limb.
8. As to the question of retaining the fracture in position by wiring, pegging or plating, it should be taken as a general rule that it is not advisable to insert, in the wound of a compound fracture, any material which is non-absorbable.
9. Drainage.—When in doubt drain, but it is a great advantage if drainage can be avoided in after-treatment. If the wound was very soiled, the Carrel-Dakin treatment should be carried out, but care must be taken that no gauze or drainage tube is allowed to become entangled with the line of fracture; otherwise, necrosis will result.

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FRECKLES

May be removed by touching daily on the end of a match with Mercuric Chloride solution 1% in alcohol.

FRONTAL SINUSITIS—*See* Diseases of the Nose.

FURUNCULOSIS—*See* Boils.

GALL-STONES

For Acute Cholecystitis *see* Cholecystitis.

Chronic Cholecystitis and Gall-Stones.—It must be remembered that Chronic Cholecystitis may cause all the symptoms of gall-stones, that gall-stones may be present without causing any symptoms and that Chronic Cholecystitis is the underlying cause of gall-stones.

TREATMENT.—The gall-bladder should be removed in all uncomplicated cases, but when complicated by suppuration and thickening of the wall, it is safer to remove the stones and drain, removing the gall-bladder two or three weeks later. Gall-stones are a frequent cause of carcinoma of the gall-bladder.

The following prescriptions have been recommended:—

R Sod. Salicylate	gr. 12	R Ætheris	℥ 8
Sod. Phosphate	gr. 20	Ol. Terebinth	℥ 6
Sod. Sulphate (dried)	3j		One capsule t.d.s.

In a glass of hot water 80 minutes
before meals.

R Oleum Terebinthinæ	℥ 5	R Ferri Succinatis	gr. 5
Syrup Acaciæ	3ss	Fel. Bovini	gr. 3
Sodii Sulphocarbolate	gr. 20	Sod. Bicarb.	gr. 10
Spt. Ætheris Co.	℥ 15		One cachet t.d.s.
Aqua Menth. Pip. ad.	3j		

t.d.s.

R Glycerine 3℥ to 1℥

In a little alkaline water daily to
prevent attacks.

FOR BILIARY COLIC.—*See* Colic.

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GANGLION

In recent cases a well fitting splint combined with counter irritation and pressure by strapping. But the most satisfactory treatment is a free incision under a local or general anæsthesia and dissecting the ganglion out.

GANGRENE

The chief forms are Dry and Moist.

The treatment of Dry Gangrene is amputation at such a site as will ensure the flaps being well nourished. It is unsatisfactory to allow the parts to separate and is often productive of very great pain.

IN MOIST GANGRENE.—If no septic complications arise wait until a line of demarcation forms before amputating. But if the general condition of the patient and the appearance of the limb suggest sepsis amputation should be immediately performed, well above the gangrenous area.

SENILE GANGRENE.—Treatment is to amputate as soon as the line of demarcation is defined, the incisions passing through healthy tissue well above the disease. In senile gangrene of the foot amputation should be performed through the lower third of the thigh.

Attempts have been made to prevent the onset of senile gangrene by producing vaso-constrictor paralysis by the peri-arterial injection of alcohol.

RAYNAUD'S DISEASE.—The best treatment is massage, electricity and hydrotherapy.

SPREADING TRAUMATIC GANGRENE—is due to the infection of a wound with the bacillus of malignant œdema. The process spreads with great rapidity and nothing short of immediate amputation as near the trunk as possible has any chance of saving the patient, but death nearly always results.

GASTRALGIA

This is a painful dyspepsia generally seen in young anæmic women, and is probably due to erosions of the gastric mucous membrane. To begin with Bismuth should be given in full doses, and then combined with Iron. It is absolutely essential to keep the patient in bed. The following prescriptions have proved useful:—

Hysterical

R Calcii Bromidi	gr. 12
Chloral Hydras	gr. 4
Codeine	gr. $\frac{1}{2}$
Aquæ Laurocerasi	℥ 15
Aquam ad.	℥j

Anæmia

R Ferri et Quin. Cit.	gr. 10
Liq. Strychnine	℥ 3
Acid Hydrochlor. Dil.	℥ 5
Aqua Chloroformi ad.	℥j
t.d.s., an hour after food.	

Hysterical, with Vomiting

R Morph. Hydrochlor.	gr. 1/10
Cocain Hydrochlor.	gr. 1/5
Tr. Belladonna	℥ 3
Emulsionis Amygdalæ	℥j

Cause Unknown

R Liq. Opii Sedativi	℥ 5 to 10
Spt. Amm. Aromat	℥ss
Aqua Carni ad.	℥j
When the pain is severe.	

Gouty

R Amm. Carb.	gr. 5
Spt. Ætheris Co.	℥ 20
Aqua Menth. Pip.	℥jss

Every 3 or 4 hours.

R Ext. Belladonna	gr. $\frac{1}{2}$
Quin. Sulph.	gr. 2
Ext. Valerian	q.s.

One pill t.d.s.

GASTRIC AND DUODENAL ULCER

As advised by Dr. A. F. Hurst, M.A., M.D., F.R.C.P.

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April, 1934

Too much stress cannot be laid on the fact that gastric and duodenal ulcers require a prolonged period of treatment, the smaller ulcers require 4 to 6 weeks and the larger 8 months. If suitable treatment is strictly carried out practically every gastric ulcer heals and the majority of duodenal. The strict diet is given for the whole period of treatment until healing is complete, which is shown by the absence of tenderness and rigidity and spontaneous discomfort, the absence of occult blood in the stools, and complete disappearance of the crater as shown by the X-rays. When the ulcer is shown by these symptoms to be healed the patient is placed on an intermediate diet for three weeks, and then begins the post-ulcer regime which he should keep for the rest of his life. The reason for this is that patients who develop chronic ulcers have in their physical make up a type of stomach that will develop ulcers, unless this

regime is adhered to. If however they take this precaution, and the ulcer is soundly healed, and any obvious foci of septic infection in the mouth, nose, and throat have been treated, the patient is unlikely to have a recurrence.

The value of milk in this diet is that it is a very efficient alkali, as volume for volume it will neutralize gastric juice with an HCL content of 0.3%. It is important to give feeds at night as often as the patient wakes, because these cases have been shown to secrete abnormally large quantities of extremely acid gastric juice throughout the night.

If there is any gastro-stasis owing to achalasia or spasm of the pylorus or to œdema and congestion round an ulcer in its immediate neighbourhood, the stomach should be evacuated by means of an ordinary stomach tube at 10 p.m. no food having been taken since 7 p.m.

ULCER DIET:—

- (1) Every alternate hour from 8 a.m. to 10 p.m. 5 ozs. of milk. This can be warm or cold and may be flavoured with tea.
- (2) Every other hour, alternating with (1), from 9 a.m. to 9 p.m., a 5 oz. feed, which may be made of any of the following:—
 - (a) Arrowroot, farola, Benger, junket, custard; to any of these red currant, apple or other fruit jelly can be added, and the junket may be flavoured with chocolate.
 - (b) At least two should consist of a thick soup or semi-solid purée of potato, artichoke, cauliflower or parsnip.
- (3) A rusk with butter should be eaten with three feeds. Small quantities of water may be drunk between feeds. Half an ounce of strained orange juice should be taken with one of the drinks.
- (4) 1 oz. of cream should be added to the 11 a.m., 1 p.m. and 5 p.m. feeds, and $\frac{1}{2}$ oz. of olive oil should be taken before the 9 a.m., 2 p.m. and 7 p.m. feeds.
- (5) According to the condition of the bowels Emulsio Magnesiæ one drachm or less should be taken immediately before each milk feed and Sod. Citrate 10 gr. Aquam ad. 3j added to each milk feed.
- (6) Atropinæ Sulphatis gr. $\frac{1}{200}$ Aq. ad. 1 dr. before the 8 a.m. and 3 p.m. feeds and 2 drachms before

10 p.m. feed. The dose of the mixture should be increased daily by 5 minims till the limit of tolerance is reached, *i.e.* dry mouth or paralysis of accommodation.

- (7) One drachm of prepared chalk to be taken half-way between feeds when heart-burn or discomfort is present.
- (8) At 7 a.m. a table-spoonful of powdered charcoal or bismuth oxycarbonate washed down by 5 ozs. of water.
- (9) Wash the mouth out after each feed.
- (10) No smoking allowed during the strict treatment.
- (11) During the night the patient should have citrated milk by his bed-side, so that whenever he wakes he can take a feed.

POST-ULCER REGIME.—To be followed permanently.

Avoid alcohol except, if desired later on, a small quantity of light wine or diluted whisky at meals. Avoid effervescing drinks and coffee. Avoid all pips and skins of fruit (whether raw, cooked, or in jam, and currants, raisins and lemon-peel in puddings and cake, nuts, and all unripe fruit. For example, an orange may be sucked but not eaten. Currants, raisins, and figs are particularly undesirable. Avoid all raw vegetables, whether taken alone (celery, water-cress), or in pickles or salad; green vegetables must be passed through a sieve and mixed with butter in the form of a purée. Porridge is only allowed if made with the finest oatmeal.

Avoid vinegar, lemon-juice, sour fruit; spinach, fried fish; pepper, mustard, curry, chutney, excess of salt; new bread; tough meat, pork, made-up dishes, high game, clear and thick meat soup. During the first six months after recovery from an ulcer it is best to avoid butchers' meat altogether.

Take plenty of butter and cream, and a table-spoonful of olive oil before each meal.

Eat slowly and chew very thoroughly. An adequate time should be allowed for meals, and rest for at least a quarter of an hour before meals. Meals must be punctual.

Don't smoke excessively. No smoking at all if any indigestion.

FOR SIX MONTHS.—A meal or feed should be taken at intervals of not more than two hours from waking till retiring,

and again if awake during the night. The feeds should consist of a glass of the following mixture, which should be prepared each morning; 35 ozs. of milk, 5 ozs. of cream, and 120 grains of sodium citrate.

AFTER SIX MONTHS OF COMPLETE FREEDOM.—A feed should be taken in the middle of the morning, on going to bed, and again if awake during the night, in addition to breakfast, lunch, tea and dinner.

A teaspoonful of the 'alkaline powder' * in a little water should be taken an hour after meals and also directly the slightest indigestion or heart-burn is felt. Alternatively if the hypochlorhydria is extreme the atropine mixture can be taken before meals.

The bowels should be kept regular by means of the magnesia in the alkaline powder, and, if necessary, liquid paraffin, but no other aperients should be taken.

Have your teeth attended to by your dentist regularly every six months. Take no drugs in tablet form.

If you have the slightest return of symptoms, go to bed on a strict diet, and consult your doctor, and do not wait for the symptoms to get serious.

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DUODENAL ULCER.—Up to a short time ago it was generally accepted that nearly all cases of duodenal ulcer should be operated on. Opinion has now swung the other way and medical treatment is considered of the first importance. Except in severe cases especially with hæmorrhage, the patient need not be confined to bed, smoking must be entirely stopped, care

* The 'alkaline powder', 5 parts of 'prepared chalk' with one part of 'light oxide of magnesia'. The proportions should be altered according to the state of the bowels.

should be taken that any septic foci are found and dealt with. Treatment then consists of a carefully graduated diet and the neutralization of acid by the administration of alkalies.

The diet should consist of citrated milk, malted milk, thick soup without particles, well boiled rice with cream, 'Benger's food, eggs and after ten days stale bread or rusks may be added.

The following is the medicinal treatment:—

R Tr. Belladonna	m 5	R Calcium Carbonate	3j
Aquam ad.	3ss	Heavy Magnesium Carbonate	3j
To be taken 20 minutes before		Sod. Bicarbonate	3ss
each meal.		Bismuth Oxycarbonate	3ij
		5j to be taken after each meal.	

SURGICAL TREATMENT IS REQUIRED IN:—

(1) Perforation; (2) Serious recurrent hæmorrhage; (3) Cases in which medical treatment carefully carried out has failed; and (4) Those cases shown by X-rays to have definite stenosis.

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ACUTE GASTRITIS.—The causes are excess of irritating and indigestible food, alcohol, arsenic, food poisoning by the Salmonella group and poison gases such as chlorine. Treatment is to remove the cause, and give a good purge Castor Oil 3j to 3iss if there is not much vomiting. In persistent vomiting lavage of the stomach is necessary. Hot fomentations or stupes to the epigastrium. Stop all food for at least 24 hours and when the stomach has been emptied of its irritating contents give:—

R Bismuth Carbonate	...	...	gr. 20
Acid Hydrocyanic Dil.	...	...	m 4
Liq. Morph. Acet.	...	...	m 12
Mucilage Acacia.	...	...	q.s.
Aqua Chloroformi ad.	...	...	3j
Every 4 hours.			

CHRONIC GASTRITIS.—Causes are oral sepsis, alcohol in a concentrated form, defective mastication and unsuitable food, certain drugs such as colchicum, mercury and squill, secondary to cardiac and respiratory disease and cirrhosis of the liver.

TREATMENT.—Remove or treat the cause. Lavage is of great importance; Hurst recommends Hydrogen Peroxide ʒss to the pint, which removes the excess of mucus. If the patient will not submit to lavage large drinks of hot water or a mineral water such as Vichy. Medicinal treatment is of little value unless the cause is first removed, then the above Bismuth, Hydrocyanic and Morphia mixture may be given. Later a combination of alkalies and bitters, or if there is much fermentation Sodium Sulphocarbolate as in the two following prescriptions:—

R Sod. Bicarb.	gr. 10	R Sod. Sulphocarbollatis	gr. 12
Tr. Rhei Co.	ʒ 1b	Sod. Bicarb.	gr. 12
Tr. Zingiberis	ʒ 30	Sp. Ammon. Aromat	ʒ 30
Inf. Gentian Co. ad.	ʒj	Tr. Gentian Co.	ʒ 30
t.d.s.p.c.		Aqua Chloroformi ad.	ʒj
		Two tablespoonsful one hour after food.	

GASTRITIS, ACUTE, IN CHILDREN

The patient should be kept warm in bed with hot fomentations to the abdomen. If vomiting has not emptied the stomach it should be washed out with warm water containing Sod Bicarb. No food should be given and only sips of water until all acute symptoms have subsided. The bowels should be emptied by an enema and a simple Bismuth mixture given.

GASTROPTOSIS

The great majority of patients who complain of Gastropotosis are the subjects of neurasthenia, and their symptoms are due to this condition, and not to any displacement of the stomach.

GENU VALGUM—*See* Knock-knee.

GIDDINESS—*See* Vertigo.

GLANDERS

ACUTE GLANDERS.—This is almost invariably fatal, there is no specific treatment, serum and vaccine therapy having failed, and the treatment therefore can be only symptomatic.

CHRONIC GLANDERS.—If naturally immune serum is available give at intervals up to 200 c.c. or repeated doses of mallein, but not 20 per cent. of cases recover.

GLANDULAR FEVER

The cause is not known and there is therefore no specific treatment. The pain from the swollen cervical and abdominal glands should be relieved by hot fomentations, and the patient kept in bed on a light diet.

GLAUCOMA—*See Diseases of the Eye.*

GLOSSITIS—*See Tongue, Diseases of.*

GLYCOSURIA

Diabetes is first excluded by taking a blood sugar curve, the condition then is either due to a Renal Glycosuria or a lesion of the pancreas due to inflammation or tumour. The former should be treated by careful dieting excluding alcohol entirely

GOITRE

Three kinds require consideration:—

1. Exophthalmic, Hyperthyroidism or Toxic Goitre.
2. Simple Parenchymatous.
3. Local lesions—Adenoma and Carcinoma.

EXOPIITHALMIC GOITRE.—The cause is unknown, there is a tendency to natural recovery in young subjects, but in older patients and the majority of cases it becomes chronic, relapses and remissions being frequent. The most important therapeutic measure is rest complete, both physical and mental, all domestic or business anxieties, worries, and sexual disturbances must be excluded. All septic foci must be dealt with as it has been definitely shown that thyroid intoxication increase with such septic infections as tonsillitis and sinusitis, but at the same time it must be remembered that these cases do not stand operation well. Next Iodine must be given preferably as Lugol's Solution 5 to 10 drops t.d.s. in milk. Iodine does not cure or curtail the length of the disease, but it brings down the level of severity and the relapses and exacerbations are not so severe. If tachycardia is not controlled by these measures, it should be treated on the general lines for this condition.

If sufficient improvement cannot be obtained from the above, it may be essential to reduce the amount of functioning thyroid by irradiation or surgical means, this may be done by X-rays or Radium, but the process takes several months. By

operation the result is obtained at once, and if performed by a surgeon having special experience in thyroid operations and after very careful preparation of the patient the risk is small.

SIMPLE PARENCHYMATOUS GOITRE.—Certain cases may be due to a demand for an increased supply of the secretion, in these cases Thyroid 1 to 3 gr. should be given each night at bed-time. Iodine has also been successfully used.

In endemic goitre McCarrison recommends intestinal antiseptics Thymol 10 gr. morning and evening with a drink of water. Great care must be taken to exclude all solvents of the drug from the diet. Simple Parenchymatous Goitre may be treated by the application of a blister or inunction of Red Iodide of Mercury ointment, with or without subsequent careful exposure to the sun's rays. Neither radium or X-rays are of any use in this kind of goitre.

GOITRE-ADENOMA.—It is uncertain as to whether the localized masses in the thyroid are tumours or regeneration nodules. The indications for operative treatment are deformity or pressure symptoms.

CARCINOMA OF THE THYROID.—Recently the results of adequate treatment have been more satisfactory, partly due to earlier operation and partly to X-rays, to which this type of carcinoma is peculiarly susceptible.

Operation in nearly all forms of goitre has a special element of danger, and unless the most careful attention is paid to the preparation of the patient operative procedure may easily lead to disaster, but in skilled hands the mortality has been greatly reduced.

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GONORRHŒA—See Special Article.

GOUT

TREATMENT OF THE ACUTE ATTACK.—The patient must be put to bed, the limb raised on a pillow and protected from the weight of the bed clothes.

One of the following local applications should be used:—

℞ Oleum Gaultheriæ	} āā 3ij	or ℞ Liq. Plumbi Subacet	m 36
Oleum Olivæ		Tr. Opii	3jss
Lin. Saponis		Aquam Dest.	3vj
Tr. Aconite		Apply on well soaked lint cover with oiled silk and lightly bandage.	
Tr. Opii			
Apply freely and cover with cotton- wool.			

Diathermy is said to quickly relieve the acute pain.

Internally a good dose of Calomel or blue pill should be given, followed by a Saline 12 hours after. Alcohol must be entirely stopped, and diet consists only of milk diluted with Potash or Barley water.

Colchicum usually relieves the pain in one of the following prescriptions, but it may be necessary to give a single dose of Morphia or Phenacetin to relieve it.

℞ Vini Colchici	m 20	℞ Colchicine	gr. 1/70
Pot. Cit.	gr. 40	Sugar of Milk	gr. ½
Aqua Chloroformi ad.	3j	Ext. Nux Vom.	gr. ¼
Every four hours until the acute symptoms subside.		Ext. Hyos.	gr. ¼
		Ext. Gentian	q.s.
		(one pill.)	

One pill every 3 or 4 hours. (Luff).

CHRONIC GOUT.—In every case of gout search should be made for a septic focus, as this may be the precipitating cause in an attack. The bowels should be regulated by mild not strong laxatives. The patient's shoes must be adjusted so that there is no undue pressure.

As regards diet all articles containing excess of nucleo-protein such as brain, kidney, liver, sweetbreads and fish-roe should be excluded, together with any food the patient has found by experience to disagree. Curries all rich and highly spiced dishes are forbidden. As regards alcohol beer, stout and red wines but especially port, should be avoided, if any alcohol is allowed it should be taken in the form of whisky. Plenty of fluid should be taken in the form of barley water or plain water with fruit juice or lemonade.

MEDICINAL TREATMENT.—Atophan, Quinophan or Cinchophan is valuable and increases the output of uric acid.

in the urine, but unfortunately may cause grave and even fatal toxic symptoms; these can be avoided by allowing an interval of five days between each course of treatment, which should not last longer than 3 days, and after all the acuter symptoms have abated giving only one or two days per month

R Atophan	gr. 10	R Pot. Iodide	gr. 10
Sod. Bicarb.	gr. 20	Pot. Citrate	3ss
For one cachet t.d.s. with a tumbler		Inf. Buchu ad.	3j
of water.		t.d.s.p.c.	

R Pulv. Gualci.	gr. 10	R Pot. Iodide	gr. 10
Pot. Iodide	gr. 10	Liq. Aisenicalis	m 2
One cachet t.d.s.p.c.		Ti. Nux Vom.	m 2
If the guaiacum causes purging		Inf. Gentian Co. ad.	3j
reduce the dose or add Cretæ Prep. 5		t.d.s.p.c.	
to 10 gr.			

GRAVEL

The commonest concretions are uric acid, and these are soluble in an alkaline medium; by giving alkalis the urine is easily rendered alkaline, and the patient at once relieved. Potassium salts are pleasanter to take and better solvents than Sodium. The Citrate or Acetate should be given in 1 or 2 drachm doses every 3 hours. Diet: Nitrogenous food should be small and stimulants stopped.

Uric Acid Gravel

R Pot. Acetatis	gr. 30	R Lathii Cit.	gr. 5
*Hexamin	gr. 8	P. Mag. Horo. Cit. Co.	gr. 30
Syrup	3ss	Hexamin	gr. 5
Aqua Destillata ad.	3j	Aqua Destillata ad.	3j
t.d.s.		t.d.s.	

R Atophan or Novatophan $7\frac{1}{2}$ gr. tablets.
2 tablets t.d.s. with plenty of water.

OXALURIA.—Oxalate of Lime is insoluble in alkaline media and for such, this treatment is useless. In cases of oxaluria, magnesium salts have been given to replace some of the calcium oxalate by the corresponding magnesium compound which is much more soluble.

Oxaluria, Useful Tonic in

R Acid Nit. Hydrochlor. Dil.	m 10
Liq. Strychnine	m 8
Spt. Chloroform	m 5
Syrup Zingiberis	3ss
Aquam ad.	3j

In a little water t.d.s.

Phosphatic Deposits

R Acid Hydrochlor. Dil.	m 10
Syrup Mori	m 30
Decoct. Hordei ad.	3j

t.d.s. in a wineglassful of water.

Phosphaturia

R Arseni Trioxidi	...	...	gr. $\frac{1}{2}$
Ext. Rhei	..	...	3ss
Ext. Nux Vom.	.	..	gr. $7\frac{1}{2}$
Ext. Gentian	..	...	3ss

Make 80 capsules. One to be taken after each meal.

GRAVE'S DISEASE—*See* Goitre Exophthalmic.

GUM-BOIL—*See* Dental Surgery.

GUM TRANSFUSION—*See* Transfusion.

GUNSHOT WOUNDS

FIRST AID.—The wound should be interfered with as little as possible, just covered with sterile gauze; hæmorrhage being controlled with a tourniquet, but only if absolutely necessary during the transport of the patient to hospital, which should be made as soon as possible. Shock is treated by warmth hot water bottles and blankets. If there are fractures these should be kept at rest by splints.

On arrival at hospital treatment should be immediately undertaken. The wound of entrance and exit are covered with sterile gauze, the surrounding skin after shaving and cleaning with spirit is painted with Iodine. A sterile dressing is then applied and the part kept in complete rest. The bullet if retained should only be removed if easily accessible, but it is most important that there should be no probing syringing or other interference with the depth of the wound. As a rule the bullet gives rise to no trouble, should it do so, it can be removed after the wound has healed by the most convenient route, but only after accurate localization, and if possible with the aid of a fluorescent screen during the operation.

In lacerated wounds after being enlarged if necessary, every recess is thoroughly explored, all tags of clothing, splinters of the missile, dirt and blood clot are removed. All muscle should be cut away until a healthy bleeding and contracting surface is reached, this is important as a preventive measure against Gas Gangrene. Many of these wounds in Europe are treated by primary suture, care being taken to obliterate all pockets, but in the East it is safer to use the Carrel-Dakin treatment. Anti-tetanic serum should be given as a prophylactic measure.

HÆMATEMESIS

The most probable causes are—Cirrhosis of the liver, Duodenal or Gastric ulcer or possibly Splenic anæmia.

Give complete physical and mental rest, the patient lying on his back, put an ice bag to the epigastium and a hot bottle to the feet, he must not be transported.

Stop all food or liquids by the mouth, for at least forty-eight hours, do not give ice to suck. Give Morphia $\frac{1}{4}$ to $\frac{1}{2}$ gr. with Atropine $\frac{1}{150}$ gr. The patient will suffer greatly from thirst, this must be treated by a mouth wash (see mouth washes), and by giving per rectum, either 5% or if the patient can tolerate it 10% of Glucose solution, 8 ozs. every 4 hours, this may be given as an enema or by the Murphy drip method. The majority of cases will respond to this treatment, but should the Hæmatomesis be recurrent, the advisability must be considered of passing a stomach tube to the cardiac orifice and washing out with ice water repeatedly (4 ozs.), until the washes return clear, and then leaving in Adrenalin 1 in 1,000 \mathfrak{z} iv to feed water \mathfrak{z} iv. At the same time Calcium Chloride 1 gr. in 100 m water intramuscularly or 10 c.c. of a 5% solution intravenously. Or alternatively Hæmo-plastin or Thrombo-plastin intravenously. In the more severe cases Blood-Transfusion will have to be considered, and should not be delayed, as quite apart from the improvement in the collapse and anæmia, it frequently has a marked effect in stopping the hæmorrhage. Should a suitable donor not be available intravenous saline or gum saline may be substituted. Severe collapse will require treatment with Camphor, Caffoin or Pituitrin.

In the recurrent cases feeding by the mouth must be withheld for five days, and then commenced with albumen water and whey, and so to citrated milk, the subsequent increase being guided by the presence or absence of occult blood in the stools. It is, of course, imperative that no purgative of any kind should be given. As regards surgical treatment of gastric or duodenal ulcer, it is not safe immediately following the hæmorrhage however desirable later. When the above treatment is not available the following prescriptions may be tried to prevent recurrence.

R Plumbi Acetatis	gr. 4	R Olei Terebin.	m 15
Acidi Acet. Dil.	m 6	Liq. Ext. Digitalis	m 15
Liq. Morph. Acet.	m 10	Mucilage Acacia	\mathfrak{z} j
Aqua Destillata ad.	\mathfrak{z} ss	Aqua Menth. Pip. ad.	\mathfrak{z} ss
In a little water every 2 hours.		Every 3 hours.	

HÆMATURIA

Is a common symptom of disease of the urinary tract. It is therefore essential to diagnose both the source and cause of the hæmorrhage, if a cystoscope is available pass it during the attack of bleeding, and the source of the bleeding can then be localized to the kidney or the bladder. If the latter, the cause

of the hæmorrhage will also be seen. If no cystoscope is available the following localizing symptoms would point to the kidney: Enlargement on tenderness of the kidney, renal colic, or smoky urine, *i.e.* blood and urine well mixed, long thin clots, renal cells and casts, these symptoms are most likely to be caused by stone, injury or tuberculosis. If the hæmaturia is symptomless the probable cause is growth or chronic nephritis.

Symptoms pointing to the bladder would be: Frequent possibly difficult micturition. The blood would be bright and passed either at the beginning or end of micturition, or possibly in large clots. Pain at the end of the penis or in the suprapubic region. Microscopically bladder epithelium. The most frequent causes of these symptoms are: Stone, enlarged prostate, cystitis simple or tubercular. Symptomless hæmorrhage from the bladder is generally due to growth benign (papilloma) or malignant. Treatment must be carried out for each of these varying conditions.

HÆMOPHILIA

The hæmorrhage may be either spontaneous usually from the mucus membranes or traumatic. The children of bleeders should be protected from injury in every possible way, as even a slight blow on a joint may lead to serious hæmorrhage, and no surgical operation of any kind undertaken with the possible exception of vaccination. For abrasions and accidentally wounds the clots are cleaned away, and cotton wool soaked in fresh normal human blood is applied to the bleeding point, or long continued pressure combined with a solution of Adrenalin Chloride may be tried. In all serious emergencies transfusion of blood should be given, and for the prevention of hæmorrhage 0.6 gr. of Sodium Citrate in 20 c.c. distilled water given intravenously every four to seven days. In extreme cases Wright advises giving Carbon Dioxide which causes prompt clotting of blood.

HÆMOPTYSIS

Not all cases of Hæmoptysis require treatment, for example, in Mitral Stenosis it may be actually of value and should be left alone. The majority of cases are due to pulmonary tubercle, but it is a remarkable fact that hæmorrhage is rare if open air treatment is being efficiently carried out. The patient should be recumbent but in the best position for ridding the respiratory tract of the blood. Give Morphia $\frac{1}{8}$ to $\frac{1}{4}$ gr., this calms any excitement and lessens cough, a most important consideration. If the bleeding continues a combination of Mercury and Opium are efficient.*

℞ Pulv. Ipecac. Co. ... gr. 4
Hydrarg. cum Creta ... gr. 1

Every three hours while bleeding continues.

A simple domestic remedy is to give Sodium Chloride 1 to 4 drachms by mouth. Amyl Nitrite inhalations, or injections of Emetine Hydrochloride are sometimes useful. Hemostatics may be given in the form of Calcium intramuscularly or intravenously also Hæmoplastin as detailed under the treatment of Hæmatemesis. In severe and recurrent cases artificial pneumothorax may be successful.

HÆMORRHAGE, CEREBRAL—*See* Apoplexy.

HÆMORRHAGE, INTESTINAL—*See* Duodenal Ulcer.

HÆMORRHAGE, INTRACRANIAL—*See* Head Injuries.

HÆMORRHAGE, UTERINE—*See* Ante- and Post-Partum Hæmorrhage.

HÆMORRHOIDS

EXTERNAL PILES.—Even when not inflamed these swellings at the anal margin may cause a good deal of discomfort and itching and when inflamed and swollen compel the patient to lie up. The most effective treatment is to remove them at once, 2 per cent. Novocaine is injected into the base of each, the greater part of which is cut off with very sharp scissors, the clot turned out and any hæmorrhage controlled by firm pressure of the dressing, but on no account should a ligature be applied as it would cause intense pain. If for any reason the piles cannot be operated on the following treatment should be carried out. After defæcation the parts should be well washed and cleaned with absorbent wool and one of the two following ointments applied:—

℞ Ung. Hydrarg. Sub-chlor.	gr. 4	℞ Morph. Sulph.	gr. 5
Ext. Opi	gr. 2	Ung. Belladonna	3j
Ext. Belladonna	gr. 2	Ung. Stramonii	5j
Lanoline	3ss		

For Intense Itching

℞ Aluminis	gr. 15
Camphoræ	gr. 12
Adipis Benzoinati	3j

Sedative and Anæsthetic

℞ Acetanilidi	ʒss
Ung. Aquæ Rosæ	3j

If inflamed and thrombosed with great pain and tension, incise the tumour, turn out clot, cut away margins and apply hot fomentations.

INTERNAL PILES.—Palliative treatment is all that is necessary in the mildest cases, and consists in sponging the protruding piles with cold water after defæcation, and pressing them gently back into the rectum, on no account must piles ever be allowed to remain prolapsed. After smearing with the following ointment or squeezing it into the rectum from a collapsible tube to which a bone rectal nozzle is fitted:—

R Ung. Acidi Tannici	...	...	3iv
Ung. Stramonii	...	...	3j
Ung. Belladonna	...	...	3j

or one of the following suppositories introduced:—

R Ext. Suprarenalis	3ij	R Ext. Hyos.	gr. 4
Olei Theobromii	3vii	Ext. Hamamelidis	gr. 4
		Olei Theobromii	gr. 45

If the hæmorrhage is troublesome it can be arrested by one of the following suppositories or ointment.

R Ichthyol	gr. 5	R Chrysarobin	gr. 15
Tannic Acid	gr. 5	Ext. Belladonna	gr. 5
Ext. Belladonna	gr. ½	Iodoform	gr. 10
Ext. Stramonium	gr. ½	Petrolati	3ss
Ext. Hamamelis	gr. 10		
Oleum Theobromatis	gr. 30		

R Chrysarobin	...	...	gr. 2
Acidi Tannici	..	...	gr. 3
Iodoform	...	...	gr. 2
Oleum Theobromatis	...	...	gr. 30

When however bleeding and prolapse are frequent with much pain and discomfort palliative measures should not be continued but operation which comes under one of the following heads advised—Injection, Ligature, or Clamp and Caution. The advantages of injection is that it does not lay the patient up and is very satisfactory in uncomplicated cases, one injection does not usually cure a pile, but if one is insufficient the injection may be repeated until all the piles have shrunk, later in life other piles may develop this is not a recurrence, but fresh piles forming in other columns of Morgagni. Injection treatment is contraindicated in elderly patients with cardiac, pulmonary, arterial disease or hepatic cirrhosis. Piles associated with anal fissure or fistula, inflamed, prolapsed gangrenous or external piles should not be injected.

Of the two methods of operation ligature or the clamp and cautery the majority prefer the former, but it is claimed for the latter that convalescence is shorter, there is less after pain and no tendency to contraction of the anal canal.

HALLUX VALGUS—See Bunion.

HAMMER TOE

When the fourth and fifth toes are affected amputation is the best treatment, but the second toe must never be amputated, but a V-shaped excision of bone is made which should include the joint.

HARE-LIP—*See* Works on General Surgery.

HAY FEVER

Failing being able to keep the patient away from the particular exciting cause. The patient should be desensitized, sets are obtainable by which the patient can be tested against a very large number of different substances by the skin test. Having discovered the causal agent this can be injected subcutaneously in gradually increasing doses. But it must be admitted that the whole treatment of desensitization has proved somewhat disappointing. In every case the nose and naso-pharynx should be put in a healthy condition by the removal of adenoids, polypi, deviation of the septum and enlarged turbinates.

R Adrenalin Chloride	gr. $\frac{1}{2}$	R Acid Carbolic	3ss
Normal Saline	3j	Menthol	5j
Phenolis	m 1	Zinc Oxide	5j
Glycerine	3ij	Oleum Amygd. Dulcis	3iss
Aqua Rosæ, q.s. ad.	3ij	Vasolini Liq., q.s. ad.	3ij
Used as a Spray for the Nose and Throat every 2 or 3 hours.		Used as a Spray with an Oil Atomizer.	

- R Borax 10 gr. to an ounce of Camphor Water is very efficient for the irritation of the eyes.

POLLACCINE—is made from the pollen, it is then put up in coloured tubes, each colour denoting a definite strength. To prevent attacks in summer, weekly injections are made for some months, the dose depending on the degree of reaction, when the extract is dropped into the eyes or on to the scarified skin.

HEAD INJURIES

These cases call for careful observation as many pathological processes may be at work, and it is therefore at first difficult to decide on a definite line of treatment or to give a prognosis. The unconscious patient is examined for symptoms of collapse, if this is present and increasing the case will invariably prove fatal. Examination is also made for any bleeding from the scalp and bleeding or the escape of cerebro-spinal fluid from the nose, naso-pharynx or ears, and injuries of other parts of the body.

The patient should be removed to hospital as operative treatment may be subsequently necessary, and placed in a quiet dark room. Collapse is treated by hot bottles and blankets, but no stimulants. The bladder and rectum are emptied. Scalp wounds are cleaned and dressed any hemorrhage being checked by pressure. Sedative drugs may be necessary for the severe headache which always accompanies recovery. Pot. Brom. and Chloral Hydras. of each 40 gr. per rectum every 4 hours, but morphia is best avoided.

Intra-cranial pressure almost invariably follows the injury, to combat this and at the same time relieve the headache, irritability and diminish the stupor produced by the cerebral edema, hypertonic salt solution is used, as it promotes resorption of cerebro-spinal fluid and thus lowers the intra-cranial pressure. In severe cases 70 c.c. of a 15 per cent. Sodium Chloride are given intravenously, or in mild cases Mag. Sulph. 25 per cent. 6 ozs. per rectum twice daily, fluid by the mouth being at the same time restricted. Lumbar puncture is another means of reducing intra-cranial pressure and is of diagnostic value as blood is rarely absent from the cerebro-spinal fluid in severe intra-cranial injury. In cases with discharge of blood or cerebro-spinal from the nose or ear, the former should be kept free of blood clot, and the latter not syringed but swabbed out with an antiseptic. In such cases meningitis is to be feared and Hexamine should be given in 10 gr. doses t.i.d.s.

OPERATIVE TREATMENT.—Compound fractures of the vault call for immediate treatment for fear of infection. Simple depressed fractures should be elevated within 4 or 5 days, and if cerebral compression is increasing in spite of hypertonic saline, simple subtemporal decompression should be done on the side on which the pupil is dilated.

AFTER-TREATMENT.—It is imperative that all cases of head injury which have been so severe as to show distinct concussion should have complete rest in bed for 3 to 4 weeks.

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HEADACHE

First the cause must be ascertained, the following is a useful classification:—

1. Due to Organic disease of the skull or its coverings—
fibrositis, periostitis, cellulitis, disease of the orbit,
mastoid, ear, nose and teeth.
2. Due to Organic disease of the brain and its membranes.—In these cases the intracranial pressure is raised. The headache is bursting, worst the first thing in the morning, increased by emotion, exertion and bending. The vomiting is projectile without relation to food and accompanied in 50 per cent. of cases with nausea. There is diplopia with failing vision and oedema of the discs. There may be giddiness and fits, with constipation, slow pulse and respiration. Lumbar puncture shows a pressure of 80 to 100 c.m.
3. Due to variations in the amount of blood in the cranium. Severe headache occurs with both High and Low Blood Pressure.
4. TOXIC.—The headache is dull uniform and heavy. The causes are:—

1. Uræmic.	6. Drugs.
2. Hepatic.	7. Tobacco.
3. Gouty.	8. Migraine.
4. Diabetic.	9. Bad Ventilation.
5. Syphilis.	
5. PYREXIAL.—It may be very severe as in typhoid, malaria, heat-stroke, measles and pneumonia.
6. REFLEX.—
 - (1) Eye.—Errors of Refraction.
 - (2) Teeth.
 - (3) Ear.
 - (4) Nose.
 - (5) Dyspeptic: (a) Reflex; (b) Auto-intoxication.
 - (6) Disease of the Uterus and Ovaries.
 - (7) Functional Diseases of the Nervous System. Including Neurasthenia, Hysteria, Neuralgia, and Epilepsy.

Note.- Neurotic headaches are constant discomfort, rather than the severe pain of Inflammatory conditions. It has been said that if the headache keeps the patient awake, it must be Organic, as a rule this is true but there are exceptions. Syphilis is the most frequent cause of Organic headache and may begin even during the secondary rash, it tends to increase at night.

TREATMENT.- Diet and attention to the digestive system is important, there are frequently certain articles of diet such as chocolates, eggs, oranges, etc. which always cause headache in some people. While some patients require a reduced diet others must be fed up. In all cases simple food and well chewed is essential.

Those cases with no definite cause are benefited by:-

R Acetanilide	gr. 2	R Antipyrin	gr. 2
Caffein Cit.	gr. 2	Caffein Cit.	gr. 2
Pulv. Guaiacum	gr. 2	Camph. Monobromate	gr. 2
For one capsule.		For one capsule.	

R Amm. Bromide	gr. 10	R Amm. Bromide	gr. 10
Phenazone	gr. 10	Phenacetin	gr. 10
Caffein Cit.	gr. 5	Caffein Cit.	gr. 5
Aqua Chloroformi ad.	℥j	Chloroform Water ad.	℥j
Repeat in 2 hours, if necessary.			

Syphilitic Headache

R Liq. Arsenicalis	m 3		
Sod. Phosph.	gr. 25		
Aqua ad.	℥j		
Once or twice daily.			

Continuous Headache

R Ext. Cannab. Ind.	gr. ½
Butyl. Chloral Hyd.	gr. 4

Bilious Headache

R Sod. Salicylate	gr. 10	R Podophyllin	gr. ½
Pot. Bromide	gr. 20	Iridin	gr. ½
Aqua Chloroformi ad.	℥j	Scopolamin	gr. ½
Every 4 hours.		Ol. Ment. Pip.	q.s.
		one pill.	

R Pil. Hydrarg.	gr. 3	R Podophyllin	gr. ½
Ext. Aloes	gr. 1	Ext. Hyos.	gr. ½ to 1
Ext. Hyos.	gr. 1	Calomel	gr. ½ to 3
At bed-time, followed by a Saline.		Ext. Col. Co.	gr. 1½

Periodic Headache and Neuralgia

R Boberinæ Sulph.	gr. 3
Acid Sulph. Aromat.	m 10
Syrup Aurantii	3ss
Aqua ad.	3ss

Every 6 hours.

Neurasthenic Headache

R Pulv. Valerianæ	gr. 3
Camphoræ	gr. 3
Methylene Blue	gr. 3
Pulv. Myristicæ	gr. 1

Two cachets daily.

<i>Paroxysmal Headache, especially after Malaria</i>			<i>Arthritic Headache</i>	
R Quin. Hydrochlor.	gr.	3	R Sod. Bicarb. 30 gr. in Vichy Water.	
Tr. Cinchonifugæ	m	5	Also—	
Caffein Cit.	gr.	2	R Quinine Valerianatis	gr. 3
Spt. Chloroform	m	10	Pyramidon	gr. 2½
Inf. Auranti Co. ad.	3j		Tritii Benzonte	gr. 8
t.d.s.			Morning and midday.	
<i>Headache of Arterio-Sclerosis</i>			<i>Night Headache</i>	
R Sodii Glycerophosph.	m	10	R Veronal	gr. 5
Pot. Glycerophosph.	m	10	in cachet.	
Syrup Codeine		3ij	<i>Local Application</i>	
Tr. Nux Vom.	m	5	R Menthol	gr. 5
Aqua Menth. Pip. ad.	3ss		Paraffin Mollis.	3ij
Once or twice daily.			Rub behind the ears.	

Headache due to Phosphaturia is relieved by Benzonte of Ammonia.

CALCIUM.—The headache from which so many women suffer, especially after the period is over, may be benefited or eliminated by Calcium.

CANNABIS INDICA.—This is of great value for chronic dull headache, especially in overworked men, and in Bright's Disease.

POTASSIUM IODIDE.—It is very useful in acute and violent headache. This form of headache is often accompanied by a rise of temperature; the cause is obscure.

HEALTH RESORTS—See Special Article.

HEART DISEASE—See Cardiac Disease.

HEAT-STROKE

Take off the patient's clothing, lie him on a charpoy in a cool place wrapped in a sheet, which has been wrung out of the coldest water available and fan. Send immediately for ice and rub ice continually over the limbs, leaving a large piece in contact with each carotid in each axilla and groin. When the temperature drops to 102° these vigorous measures may be curtailed, but the temperature in the rectum must be taken every 20 minutes as it is very liable to rise again, when the above measures must be repeated. Cardiac stimulants in the form of Camphor or Caffein hypodermically will probably be required at this stage.

AFTER-TREATMENT.—These cases should be treated as one of head injury by prolonged rest in a cool quiet room, with change to a cool climate and in severe cases no return to the tropics.

PROPHYLAXIS.—Cases generally occur after a long spell of high air temperature especially if moist, contributing causes are alcohol, bad ventilation and overcrowding, warm tight clothing, muscular exertion, ill health, not drinking sufficient liquid, increasing age and prolonged residence in the tropics. The dark races and women are rarely attacked.

HELIO-THERAPY.—See Special Article.

HEMIPLEGIA

The following refers to hemiplegia due to vascular lesions, hemorrhage, embolism and thrombosis. Apart from the cause much can be done for these cases of spastic paralysis, i.e. loss of voluntary motor power with a spastic or hypertonic condition of the muscles by preventing faulty positions of the joints. Passive movements of the joints should be performed regularly to prevent adhesions and contractions, massage is useful at first combined with these movements, but should be discontinued when voluntary power is returning. Electricity is worst than useless, but heat in the form of diathermy may help.

The use of drugs is most disappointing, but local operations on muscles and tendons such as tenotomy is often very effective. It is important to realize that from the above treatment much can be done to prevent the patient's arm and leg from becoming useless, as in the great majority of hemiplegic cases the tendency is towards recovery even if partial. Also that recovery is less in patients who do not try, and that there is power to do more than the patient himself realizes.

HEPATITIS, AMOEBI

Treatment with Ictine is remarkably satisfactory, being a very specific drug. The total dosage of the course should be from 8 to 16 grains varying according to the weight of the patient, the average being 12 gr. If more than these doses are given toxic symptoms may develop in the form of paralysis as Ictine is cumulative. It is important to also give $\frac{1}{2}$ gr. doses of Ictine by the mouth at the same time, to destroy the *Amoeba Histolytica* within the lumen of the bowel before they have had time to reach the resistant encysted stage.

After an interval of a fortnight a further course can be given if necessary, but usually under this treatment the temperature has dropped to normal at the end of a week, and the

enlargement, pain and tenderness of the liver, and the leucocytosis have been greatly reduced. If however these symptoms continue suppuration has probably taken place and the treatment is that of liver abscess. Alcohol should be avoided during this treatment.

HEPATIC ABSCESS

The above treatment having been carried out for Hepatitis and having failed to bring down the temperature, leucocytosis and the pain and enlargement of the liver. It is generally advisable to aid the Emetine by aspiration, if the abscess is localized this can be done under local anaesthesia, but if a number of exploratory punctures, which should not exceed six, have to be made then general anaesthesia is necessary, but it must not be chloroform. My experience is that it is a most dangerous anaesthetic in liver abscess, and that a large percentage of all the deaths which occur under anaesthesia in India are due to chloroform in liver abscess. The use of a large sized canula is advisable as although the pus is comparatively thin in some cases, it may be very thick and as much as 4 to 6 pints. After aspiration quinine as formerly is not now injected into the cavity, and the open operation is no longer justified. Aspiration may have to be repeated after a week or so if the signs persist and the abscess refills. Aspiration may not be absolutely necessary as Emetine has the power to cause the largest abscesses to encyst and clear up. The course of Emetine should be the same as recommended under Hepatitis except that a smaller dose morning and evening is generally better than one large dose.

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HEPATIC DISTURBANCE

The following prescriptions are recommended:-

R Tr. Podophyllin	m 5	R Tr. Eucalyptin	m 30
Amm. Chloride	gr. 10	Vm Pepsini	3j
Liq. Ext. Eucalyptin	m 10	Syrup Ginger	3ss
Tr. Nux Vom.	m 2	Inf. Calumba ad.	3j
Spt. Chloroform	m 10		
Aqua ad.	3j	Twice daily in a little water.	

R Acid Nit. Hyd. Dil.	m 8	R Acid Nit. Hyd. Dil.	m 10
Tr. Nux Vom.	m 5	Sod. Sulph.	3j
Liq. Ext. Tanacet.	3ss	Liq. Styracina	m 4
Aqua Chloroformi ad.	3j	Spt. Chloroform	3ss
		Aqua ad.	3j

Biliary Disturbances with Catheles in the Urine

R Sod. Sulph.	...	...	...	gr. 20
Sod. Pot. Tart.	..	...	...	3j
Tr. Nux Vom.	...	..	..	m 10
Inf. Buchu ad.	..	..	...	3j

HERNIA

The treatment of Hernia is considered under the heads (1) Palliative, (2) Operative, (3) Strangulated.

Palliative consists of the reduction of the hernia and the wearing of a truss to keep it up. The disadvantages of a truss are--(1) That the condition is not cured except perhaps in infants under eighteen months of age, and it renders a subsequent operation more difficult and the chance of cure less, as its constant pressure causes atrophy and matting of the tissues around the neck of the hernia, also delay, as the earlier in life an operation is performed the greater are the chances of a permanent cure. (2) The natural tendency of hernia is to increase in size so that sooner or later the truss will be rendered useless by the increasing pressure of the hernia, and this is true of hard manual labour on the one hand, or of sedentary occupation on the other, as both tend to increase the size of the hernia. (3) They are costly as children rapidly grow out of the size and poor persons who work for their living quickly wear them out. (4) They are uncomfortable and inconvenient even when well fitted by an expert. (5) Most important of all is the ever present danger of strangulation. The following cases should be advised to use a truss:-

- (1) Over the age of 65, the tissues may be degenerated and the hernia tending to be larger the recurrence rate is much higher.
- (2) Patients suffering from advanced diabetes, nephritis, chronic bronchitis and hæmophilia.

OPERATIVE.--With the above exceptions the surgeon will advise operation at any age. The points to be aimed at are:-

- (1) Complete obliteration of the sac and its diverticula, this is best done by Bassini's operation, the sac after being emptied is removed, the open neck being closed by transfixion and ligature.

- (2) Closure of the inguinal canal by either Halstead's or Bassini's method.
- (3) Complete dryness of the wound.
- (4) After operation three to four weeks in bed, followed by two months of gradually increasing exercise in order to obtain an unstretchable cicatrix.

In some large scrotal hernie the local tissues are not sufficient for repairs and Gallie's operation is performed by cutting strips of viable fascia from the ilio-tibial band of the thigh and stitched across to fill the gap, the sac being left in the scrotum.

FEMORAL HERNIA.—The best operation for femoral hernia is by approach through the inguinal region, the neck of the sac is entirely freed from its surroundings as high as possible, and treated exactly as an inguinal hernia with the same precautionary points, the femoral canal being closed.

UMBILICAL HERNIA.—Here again there must be complete removal of the sac and closure of the abdomen in separate layers.

STRANGULATED HERNIA.—

SYMPTOMS.—(a) *Local.*—An irreducible painful swelling at one of the hernial openings with no impulse on coughing.

(b) *General.*—Symptoms of acute intestinal obstruction, the symptoms being very acute if the contents are small intestine, and less acute with large intestine or omentum.

It should be remembered that the patient is frequently unaware that a hernia exists.

TREATMENT.—The hernia must be immediately reduced by:—

- (a) Taxis, or
- (b) Herniotomy followed by a radical cure, if local and general conditions permit.

(a) *Taxis.*—One attempt, and one only, may be made in the inguinal variety, if the symptoms are not severe and the strangulation recent. It is most likely to be successful in children. In femoral hernia, taxis is rarely successful; in umbilical hernia, the sac should be lifted from the abdominal wall and moved from side to side to displace the contents. No attempt will, of course, be made if the hernia was irreducible before strangulation.

The disadvantage of this line of treatment is that it presupposes that the sac contents are fit to be returned into the abdomen, but neither the length of strangulation, severity of symptoms nor condition of skin gives any criterion of the condition of the contents.

If taxis is apparently successful, but the symptoms of obstruction persist, and the hernial orifice is clear, the abdomen should be opened, in the middle line below the umbilicus, and the obstruction found and dealt with.

(b) *Herniotomy.*—

Inguinal.—An incision is made over the neck of the hernia and in its long axis, the tissues are divided layer by layer until the sac is recognized by its bluish colour and gush of fluid when opened. The hernia director is then introduced above and to the inner side. Two or three nicks are then made in the neck of the sac, in an upward and inward direction. The contents are then gently drawn down and very carefully examined. If healthy, they are returned into the abdomen and a radical cure performed by (1) Isolating the sac, (2) Ligaturing the neck, (3) Suturing Poupart's Ligament to the Conjoint tendon behind the cord.

If, however, the bowel is gangrenous, as shown by loss of sheen, greyish colour and flaccidity, it should be incised and the wound left open; unless the patient's condition and the skill of the surgeon permit of resection of the gangrenous part. Gangrenous omentum should be ligatured and removed.

Femoral.—A vertical incision is made slightly to the inner side of the swelling. The sac opened as in inguinal hernia. The director is then passed to the inner side of the contents, and Gimbernat's Ligament divided by cutting directly inwards. Care should be taken that the contents of the sac do not slip back into the abdomen when the incision is made, as they would then escape examination.

If the gut is gangrenous, the abdomen should be opened in the middle line and the constriction and bowel dealt with from above. If the contents of the sac are healthy, and can be returned into the abdomen, a radical cure should be performed by isolating the sac, ligature of its neck and suture of Poupart's Ligament to the periosteum of the pubic bone on the inner side of the femoral vessels.

Umbilical.—A transverse oblique incision is made above and below the hernia, and carried down to the rectus sheath; clear the sheath from the neck of the sac in all directions, open the sac from above, and if the contents are healthy, perform

a radical cure by separating the peritoneum from the rectus aponeurosis; close the former with catgut sutures and the opening in the latter with Kangaroo tendon, finally closing the wound.

All severely damaged omentum should be ligatured and removed. Gangrenous bowel should be dealt with as directed under Inguinal Hernia.

Obturator.—This condition is rarely diagnosed until an exploratory laparotomy is performed to ascertain the cause of the obstruction. The patient is then put in the Trendelenburg position and dealt with on general lines as above.

In dealing with strangulated hernias, no matter how unskilled the practitioner may be as an operator, it is his absolute duty to divide the constriction at the neck of the sac, and relieve the strangulation, as, otherwise, nothing can save the patient's life.

HERPES ZOSTER

The urgent indication is to relieve pain. One of the following Analgesics should be tried:—

℞ Aspirin	gr. 7	or ℞ Caffem Salicylate	gr. 1
Pyramidon	gr. 6	Phenol Salicylate	gr. 15
Quin. Salicylate	gr. 1½	Phenacetin	gr. 10
Codeine	gr. ½	One powder every 2 hours until the pain is relieved.	
One cachet every 4 hours.			

Morphia hypodermically may be necessary but should be avoided if possible.

Locally one of the following powders should be dusted on and covered with a large pad of wool:—

℞ Starch	ʒij	or ℞ Morph. Sulph.	gr. 20
Zinc Oxide	ʒj	Sod. Bicarb.	ʒij
Pulv. Camph.	gr. 80	Creta Prep.	ʒij
		'Pale.	ʒij

Or an ointment of Ichthyol 20 per cent. in Lanoline spread on lint.

POST-HERPETIC NEURALGIA.—May be a most troublesome condition especially in old people. Treatment is by local applications in the form of heat, galvanic current, a single dose of X-rays and the use of analgesics. Failing this operative treatment may be necessary in the more severe cases, such as Alcoholic injection or division of the posterior nerve roots.

HICCUGH

This is always looked upon as a serious symptom among Indians, the causes and treatment are therefore given in full.

The causes of hiccough are:

1. INFLAMMATORY - -

- | | |
|-------------------------|----------------------------|
| (1) Gastritis. | (5) Suppuration within the |
| (2) Peritonitis. | abdomen. |
| (3) Strangulated hernia | (6) Severe typhoid. |
| (4) Appendicitis. | (7) Severe pericarditis. |

2. IRRITATIVE.--

- | | |
|---------------------|------------------------------|
| (1) Swallowing very | (3) Advanced anemia. |
| hot food. | (4) After passing catheters, |
| (2) Disease of the | stricture urethra, etc. |
| oesophagus. | |

3. SPECIFIC

- | | |
|---------------------|------------------------|
| (1) Gout. | (5) Pregnancy. |
| (2) Diabetes. | (6) Graves's disease. |
| (3) Chronic Bright. | (7) Addison's disease. |
| (4) Alcoholism. | |

4. NERVOUS.--Primary cause in the nervous system.

- | | |
|----------------------|-----------------------------|
| (1) Hysteria. | (5) Cerebral hæmorrhage. |
| (2) Epilepsy. | (6) Meningitis. |
| (3) Shock. | (7) Exhaustion in severe or |
| (4) Cerebral tumour. | prolonged illness--a sign |
| | of bad omen. |

TREATMENT. Gentle vertical pressure on the cricoid for some minutes will often stop the spasm or firm pressure over the ensiform cartilage for 4 or 5 minutes. In toxic cases all food by the mouth should be stopped and elimination promoted by giving large quantities of fluid. Forceful traction on the tongue maintained for one or two minutes at a time, or the passage of a stomach tube a few inches into the œsophagus and leaving it there for ten minutes, are all measures which may be tried.

℞ Oleum Cajuput 3 or 4 m alone or with Tr. Opii m 5.

℞ Nitro-glycerine 1/100 gr. tabloids frequently repeated.

℞ Amyl-Nitrite inhalations.

℞ Crocoto m 3. Pulv. Opii ½ gr. in pill.

℞ Morphia hypodermically.

℞ Olei Succini m 5.

℞ Liq. Potassæ

Tr. Camph. Co.

Mucil. Aneia

Aqua Menth. Pip. ad.

m 10

m 40

3j

3j

Every 2 hours.

℞ Oleum Perubanthine

Spl. Nitrous Ether

Aqua Menth. Pip. ad.

m 10

m 30

3m

<i>Enema</i>				
R Pot. Bromide	...	...	...	gr. 40
Tr. Opii	...	...	...	m 20
Aquam ad.	...	...	...	℥vi

Personally I am a strong believer in Musk 5 to 10 gr. in pill with Liquorice. As a last resort the injection of Novocain into the phrenic nerve may be tried, an interval of a day being allowed between the injection on the two sides.

HIGH BLOOD PRESSURE—See Arterio-Sclerosis and High Blood Pressure.

HOOK-WORM DISEASE

Four drugs have been extensively used: Oil of Chenopodium active principal Ascaridol, Thymol, Beta-Naphthol, and Carbon-tetrachloride, unfortunately all of them are toxic, but speaking generally the treatment under hospital conditions is very satisfactory. Probably the most efficient is a combination of Carbon Tetrachloride and Oil of Chenopodium in the proportion of 1.5 c.c. of the former with 0.75 c.c. of the latter Ascaridol, this is a single dose for an adult, and should be followed by a saline purge after half an hour. This treatment is said to remove 98.9 per cent. of the worms and also round worms at the same time, the method is safe if the drugs used are pure, the dose accurate and in proportion to the body weight.

Thymol is safe and most effective, but expensive, the maximum dose for adults should not exceed 60 gr. It is best administered in cachets divided into three equal parts at hourly intervals, after a preliminary purge of Mag. Sulph. and followed by another dose of Mag. Sulph. two hours after the last cachet. During the treatment it is important that no greasy food or alcohol is taken as these are solvents of Thymol. Beta-naphthol has the drawback of being irritant to the kidneys. Oil of Chenopodium has the disadvantage that different samples contain varying amounts of the active principal. It can be given in the following mixture:—

R Chenopodium Oil	...	...	m 8
Chloroform	...	...	m 7
Mucilage Gum Acacia	...	...	℥j
Aquam ad.	...	...	℥ss

Three doses at hourly intervals after a saline purge the previous night and followed by a second saline two hours after the last dose. Or it may be given in gelatin capsules.

Carbon Tetrachloride has the advantage that it is cheap, the cost being only ¼d. for each case, keeps well and has no objec-

tionable taste. Adult dose 3 c.c., children 3 m for each year of age.

PROPHYLAXIS.—The people in infected areas are continually being infected from faecal infected soil, if the faeces are properly disposed of (*i.e.* buried to a depth of at least two feet the larvæ are then unable to work their way to the surface) the infection will automatically be reduced to harmless proportions. Salt is useful under some conditions, as spread over contaminated soil and latrines it will prevent the development of the larvæ.

HYDROCELE

Acute and Chronic hydrocele occur as part of the inflammatory conditions of the testis and epididymis and require no treatment apart from the primary condition. The pathology of what may be called common vaginal hydrocele is unknown. The treatment is either Palliative by tapping or operative, injection of various irritants into the sac has recently been revived and is still subjudice. There is one important point to remember in tapping a hydrocele, and that is in about 3 per cent. of all cases, there is inversion of the testis so that the epididymis lies in front then the body of the testis and behind the tunica vaginalis; failure to recognize the condition is a serious matter as hæmatocele frequently results and possibly suppuration. Therefore when tapping a hydrocele, that is not translucent enter the trocar to the outer side instead of the usual position in front.

Radical cure of hydrocele is carried either by (a) Excision of the tunica vaginalis lining the scrotum, the essential point in this operation is to arrest all hæmorrhage even the smallest bleeding point, otherwise troublesome hæmatoma will result, this in India is generally a matter of great difficulty as the tunica vaginalis is much thickened and very vascular; (b) Inversion of the sac, with or without suture in that position, recurrence is said to be rare.

HYDROCEPHALUS

The various operations for this condition while giving some degree of temporary success the ultimate results are most disappointing, lumbar puncture is not recommended as there is considerable risk of sudden death. Bandaging the head and drugs are useless.

HYDROPHOBIA—*See Rabies.*

HYPOPION—*See Diseases of the Eye.*

HYDROTHERAPY—*See* Special Article.

HYPERPIESIS—*See* Arteriosclerosis.

HYSTERIA

Mothers should avoid spoiling their children, which is the seed of hysteria. An important point in treatment is to remove the patient from her house and carry out complete isolation in a nursing home. The Weir Mitchell treatment should be carried out in all obstinate cases. The following are useful prescriptions:—

℞ Ext. Cimicifugæ	gr. ½	℞ Moschi	gr. 2
Ext. Valerianæ	gr. 1	Ext. Valerianæ	gr. 1
Ext. Sumbul	gr. 2	Ext. Opii	gr. ½
For one pill, twice daily.		For one pill, twice daily.	
℞ Zinci Valerianatis	gr. 2	℞ Moschi	gr. 5
Acid. Camphoric	gr. 1	Zinci Valerianæ	gr. 5
Ext. Belladonna	gr. ½	Pil. Asafetidæ	gr. 3
Cannabini Tannatis	gr. ½	For one capsule, twice daily.	
For one pill, twice daily.			
℞ Tr. Moschi	m 30	℞ Tr. Valer. Amm.	3ss
Tr. Sumbul	m 30	Tr. Belladonna	m 5
Tr. Valer. Amm.	m 30	Strontii Bromide	gr. 15
Tr. Cannabis Ind.	m 5	Syrup Glycerophosph. Co.	3ss
Mucil. Acaciæ	3j	Aqua Dest. ad.	3j
Aqua Chloroformi ad.	3j		

Nerve Sedative

℞ Ext. Uiyos.	...	...	gr. 2
Zinci Valerianatis	...	...	gr. 2
One pill, twice daily.			

ICHTHYOSIS

In its milder forms it is a constitutional dryness and roughness of the skin. The patient should take a daily bath and rub in that form of grease which has been found by experiment to suit his skin best, to this may be added in the proportion of 2 to 5 per cent. an antiseptic such as Resorcin, Ichthyol, Sulphur, or Salicylic Acid.

Internally thyroid gland does good in some cases, also cod-liver oil, peas, and beans.

IMMUNO-THERAPY—*See* Specific Therapy.

IMPETIGO CONTAGIOSA

This is the commonest of all skin diseases, but most cases can be cured within ten days by the following treatment. The

crusts must be frequently removed by Boracic starch poulticing, and the part is then dressed with an antiseptic, but it is essential that this should be weak, 1 per cent. of Ammoniated Mercury in zinc paste is the best, it must not be applied on the top of the crusts.

IMPOTENCE, SEXUAL

May be Primary or Secondary. Primary is by far the most common and is functional or psychic in origin. Secondary impotence is either organic or due to deformity. Such as defects of the penis, hypospadias, epispadias, phimosis, stricture. Mechanical as hydrocele, elephantiasis, hernia, and obesity. General conditions as diabetes, alcoholism, drug habits, and endocrine disturbances. Disease of the central nervous system, tabes, myelitis, post-diphtheritic paralysis, etc.

In the treatment of the Primary form the most essential point is to gain the patient's confidence by a careful and detailed examination. After the examination is complete and nothing has been found, the patient should be told that with proper treatment he can be completely cured. At the same time a thorough history should be taken, to ascertain if there is fear of any condition, and thus arrive at the psychological factor responsible for the condition.

No statement that the patient makes should be laughed at or treated lightly, and a study of his dreams may prove useful. Functional impotence is due to the reflex centres in the cord being inhibited by the higher brain centres. Everything must be done to improve the patient's general health by moderate exercise in the fresh air, change of scene, cold baths, etc.

The drugs that have been tried are legion, but no one can be said to be a true aphrodisiac, Yohimbine Hydrochloride 1 per cent. solution in alcohol dose 5 to 15 m has proved disappointing, Strychnine is useful but is generally wrongly given as a routine, whereas pills of 1/20 gr. each should be given every 2 hours for three doses before the expected intercourse. The following prescriptions have all proved useful in some cases:—

R Phosphorus	gr. 1/50	R Liq. Ext. Damianæ	m 80
Quinine Sulph.	gr. ½	Syr. Glycerophosph. Co.	m 80
Strychninæ	gr. 1/50	Syr. Hypophosph. Co.	m 80
Acid Arsenious	gr. 1/50	Aqua Chloroformi ad.	3j

To be taken in a little water t.d.s.

R Tr. Nux Vom.	m 5	R Tr. Damianæ	3j
Liq. Ext. Damianæ	3ss	Tr. Phosphori	m 15
Ferri Pyrophosph.	gr. 2	Tr. Quininæ	3ss
Glycerini	3ss	Syr. Aurantii	3ss
Elixir Cinchonæ ad.	3iv	Vin. Aurantii ad.	3ss

t.d.s.

In a little water t.d.s.

R Liq. Strychninæ	m 5	R Ferri Sulph. Exsicc.	gr. 1
Liq. Ferri Perchlor.	m 10	Ext. Nux Vom.	gr. ½
Glycerine	m 30	Quininæ Sulph.	gr. ½
Aqua Dest. ad.	℥ss	Ext. Damianæ	gr. 2
t.d.s.		For one pill; t.d.s.	
R Ext. Damianæ	gr. 3	R Strychninæ	gr. 1/30
Phosphori	gr. 1/30	Phosphori	gr. 1/30
Strychninæ	gr. 1/30	Ferri Sulph. Exsicc.	gr. 1
For one pill; t.d.s.		Pil. Coloc et Hyos.	gr. 1
		For one pill; twice daily.	
R Strychnino Sulph.	gr. 3	R Auri et Sodii Chloridi	gr. 1
Phosphorus	gr. ½	Zinci Phosphidi	gr. 2
Ext. Cannabis Ind.	gr. 30	Ferri Phosphatis	gr. 20
Ext. Damianæ	℥ij	Strychnino Sulph.	gr. ½
Tr. Cantharidis	m 20	Calcii Glycerophosphatis	℥j
Make up into 40 pills. One pill		Make 20 capsules. One capsule	
every 6 hours until all are taken.		3 times a day.	

Testicular Preparations.

- R Liq. Testicularis, 15 to 30 m hypodermically or by mouth.
 R Tablets of Didymin 5 gr.

Surgical measures such as implantation of testicular grafts have only been useful in cases in which a deficiency of the internal secretion of the testis has been shown.

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INCONTINENCE OF URINE—See Enuresis.

INDIGESTION—See Dyspepsia.

INFANT FEEDING—See Special Article.

INFANTILE PARALYSIS

During the acute stage the patient should be confined to bed and treated as infectious, lumbar puncture should be performed daily for 4 days and fluid freely withdrawn. Salicylates

should be given for the pain and fever or Hexamethylamine in 10 gr. doses 4 hourly. It is all important to give complete rest to the paralysed muscles, and prevent their stretched as if this happens their recovery is greatly hindered. After an interval of 4 or 5 weeks massage, passive movements and re-educational exercises should be commenced, but electrical treatment in any form is of doubtful value.

INFLUENZA

There is no specific remedy, but treatment is important in order to avoid any dangerous complications. It is most important even in the mildest cases that the patient goes to bed and remains there until the temperature has been normal for 48 hours, plenty of fresh air is important. At the outset a dose of Calomel followed next morning by a Saline should be given. Diet should be fluid in frequent small quantities with plenty of fruit juice and 2 ozs. of Glucose daily.

As regards treatment by drugs the remedies that have been recommended are endless; S.U.P. 36, 1 c.c. given intramuscularly, on the first, second and fourth day certainly appears to do good in some cases. The following are useful prescriptions:—

R Aspirin	gr. 5	or R Sodium Salicylate	gr. 12
Caffein Cit.	gr. 1	Phenazone	gr. 4
Phenacetin	gr. 2½	Tr. Nux Vom.	m 5
Pulv. Ipecac Co.	gr. 5	Liq. Ext. Liquorice	3ss
For one cachet every 4 hours.		Aqua Chloroformi ad.	3j
		4 hours.	

When respiratory symptoms are present

R Vinum Ipecac	m 8
Liq. Amm. Acet.	3ij
Tr. Camph. Co.	m 20
Syrup Pruni Virg.	3j
Aquam ad.	3ss

Every three hours.

For severe pains in back and limbs

R Pyramidon	gr. 5
Phenazone	gr. 5
Caffein Cit.	gr. 1

For one cachet. Every 2 to 3 hours for 4 doses.

For Insomnia

R Medinal	gr. 5
R Paraldehyde	3j to 3ij

In very sweet tea.

For troublesome cough

R Syrup Apomorphine	m 20
Syrup Codeine	m 20
Syrup Pruni Virg.	m 20

A teaspoonful occasionally.

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INSOMNIA

May be divided into two classes of cases:—

1. Those arising from such conditions as fever, pain and cough, etc. in a great number of diseases, the treatment of these disturbing conditions is part of the general treatment, and when a hypnotic is necessary one of the following prescriptions can be used. Except that as a rule Opium and its preparations are not used for insomnia in children, bronchitis and renal disease.

2. The other causes of sleeplessness may be grouped under three heads: psychic—due to hyperæmia of the cerebrum from severe mental shock, worry and overwork.

TOXIC.—Due to constipation, renal disease, tea, coffee, alcohol, snuff and tobacco.

SENILE.—The cerebral arteries have become dilated, are less elastic and contractile, and therefore cannot diminish sufficiently in size to produce the degree of cerebral anæmia necessary for sleep.

TREATMENT.—The first essential is to exclude the above causes when possible. A hot bath on going to bed is helpful, some patients benefit from a hot drink in a thermos and a biscuit by their bed-side, taken on waking, and this will often put them to sleep again. Massage is very effective in some cases and electrical treatment in others. As regards drugs first try Aspirin gr. 10 with a hot drink on going to bed; if this is not successful Medinal 5, 7 or 10 gr. is probably the safest and best hypnotic. Sedobral tablets, one or two, dissolved in a cup of hot water at bed-time (one tablet is the equivalent of 15 gr. of Bromide). Or alcohol in the form of hot whisky and water with lemon.

In bad cases combine Bromide and Chloral for one or two nights:—

℞ Pot. Bromide	gr. 40	℞ Liq. Bromidi Co. B.P.C.	3ss to ʒi
Chloral Hydras	gr. 20	Each drachm contains 15 gr. each of	
Elix. Simplex	3ss	Pot. Brom., Chloral Hydras, also	
		Cannabis Indica, Hyoscyamus and	
		Glycerine.	

Pot. Bromide may be combined with Chloralamide, Veronal or Morphia as in the following prescriptions:—

℞ Pot. Bromide	gr. 30	℞ Pot. Bromide	gr. 80
Liq. Morph. Hydrochlor.	ʒss	Veronal	gr. 8
Tr. Cardamon Co.	m 20	Elix. Simplex ad.	ʒss
Aqua Chloroformi ad.	ʒj		
℞ Pot. Bromide	gr. 80	Paraldehyde is a very safe hypnotic,	
Chloralamide	gr. 80	but with an extremely disagreeable	
Liq. Ext. Liquorice	ʒss	taste. This can be disguised by	
Vin. Xerici	ʒiv	Liquorice or Syrup of Tolu.	
Aqua Dest. ad.	ʒj		
℞ Medinal gr. 5 to 10 alone or		℞ Paraldehyde	ʒj
combined with Asprin 10 gr.		Liq. Ext. Glycyrrh.	m 30
or		Syrup Aurantii	ʒss
℞ Adalin	gr. 5 to 10	Aqua Dest. ad.	ʒij
Are mild and useful hypnotics.			
<i>For wakefulness when the patient</i>	<i>goes to bed</i>	<i>For wakefulness in the latter part</i>	<i>of the night</i>
℞ Trional	gr. 5 to 10	℞ Sulphonal	gr. 10 to 15
		In gelatin capsules.	

Opium can be well prescribed as Pil. Saponis Co. gr. 2½. One or two pills to be taken at bed-time.

If there is much excitement give Luminal 1½ to 3 gr. dissolved in hot water.

INTERNAL DERANGEMENT OF THE KNEE-JOINT— *See Knee-joint.*

INTESTINAL OBSTRUCTION

In investigating the causes of obstruction in any tube, it is a useful rule to think of the possible causes within the lumen, in the wall and pressure from without. In the case of the intestine, the causes within are faecal accumulation and gall stones; in the wall, carcinoma and acute intussusception; but the most frequent causes are pressure from without, i.e. strangulated hernia, obstruction by bands and adhesions and volvulus. The essential point is early diagnosis; the chief symptoms are sudden onset of intense abdominal pain of a colicky nature, rigidity of abdomen, followed by vomiting and symptoms of shock.

In any case with these symptoms no food or drugs, especially an aperient, should be given. In every case endeavour to ascertain the cause if possible; intussusception is the most probable in children; a careful history should be taken; a neglected appendicitis is a fertile cause from adhesions; continuous diarrhoea or alternating diarrhoea and constipation would suggest carcinoma of the colon. Then examine all the hernial regions and per rectum, uncover the whole abdomen and examine this most carefully. Give a turpentine enema with the patient lying

on his left side and pelvis raised. If the symptoms continue, an exploratory operation should be at once prepared for; then, and not until operation is decided on, give a moderate dose of morphia and atropine.

Before operating wash out the stomach and rectum and give intravenous saline. The abdomen is then opened below the umbilicus through the medial edge of one or other rectus; the primary incision is small only admitting three fingers; the abdomen is explored. The caecum is first examined, if distended the colon should be traced, if empty the obstruction is probably in the small intestine, if empty and contracted intestine is discovered trace upwards until distended bowel is found at the seat of the lesion, then enlarge the incision and, if possible, deal with the cause. If the bowel is greatly distended or the obstruction cannot be directly dealt with on account of the patient's condition, the essential thing is to drain the intestine as the patient is being killed by toxæmia. The following degrees of the condition of the obstructed bowel must be considered:—

1. Obstruction removed and peristalsis begins, the abdomen may be closed.
2. Obstruction removed, but peristalsis does not begin, the intestine being much distended, drain by a Paul's tube.
3. Obstruction cannot be removed except by a prolonged operation, drain by Paul's tube and subsequently treat the obstruction.
4. Obstruction has already caused gangrene, resect the intestine if the patient's condition permits, and in any case drain by Paul's tube.

Note.—In Nos. 2, 3 and 4, always inject B. Wolehii anti-toxin which is very effective in dealing with intestinal toxæmia, and clinical improvement is usually very marked. The above is only a general outline. For details consult books on General Surgery.

INTESTINAL WORMS—See Worms, Intestinal.

INTRACRANIAL HÆMORRHAGE—See Head Injuries.

INTRACRANIAL TUMOURS—See Brain Tumours.

INTUSSUSCEPTION

Treatment is immediate operation. It is not right to waste time in attempts at reduction by rectal injection.

IONIZATION—*See* Electrotherapeutics.

IRITIS—*See* Diseases of the Eye.

ISCHIORECTAL ABSCESS—*See* Abscess.

ITCHING—*See* Pruritus.

JAUNDICE

The causes of Jaundice are many, but they may be divided into:—

1. Jaundice due to obstruction of the larger Bile-ducts especially of the common Bile-duct, which should be considered as causes within, in the wall of and pressure on the duct from without.
2. Jaundice without obstruction of the larger Bile-ducts, which may be grouped under:—
 - (a) Associated with Acute Infections, such as Pyæmia, Malaria, Yellow-fever, etc.
 - (b) With disease of the Liver, such as Carcinoma, Acute Yellow Atrophy, Tropical Hepatitis.
 - (c) Poisoning, such as Chloroform, Phosphorus, Snake-poison, Arseno-benzol compounds.
 - (d) Unclassified as—Icterus Neonatorum, Acholuric and Familial Jaundice, Pernicious Anæmia, Leukæmia, etc.

In the majority of cases the treatment comes under the general condition, but the following forms have to be considered:—

JAUNDICE, CATARRHAL.—The patient must rest in bed until the yellow tinge has entirely disappeared, being kept very warm. The diet should be light consisting of vegetable soups, broth, skimmed milk; no fatty articles should be given but sugars and starches freely. The bowels should be kept open with a small dose of Calomel followed by a combination of Mag. Sulph. and Mag. Carb. in the morning. The intestinal catarrh and flatulence should be treated with the following mixture:—

R Sod. Bicarb.	...	...	gr. 12
Liq. Bismuthi et Amm. Cit.	...	...	3j
Acid Hydrocyanic Dil.	...	...	m 9
Sp. Amm. Aromat.	...	...	m 20
Tr. Cardamon Co.	...	...	m 10
Aqua Ment. Pip. ad.	...	...	3j

Four times daily.

JAUNDICE, FAMILIAL.—This is a dangerous form occasionally seen in the newly born. It should be treated by the daily injection for 4 days of 5 c.c. of horse serum.

JAUNDICE, SYPHILITIC.—It is important not to give Salvarsan preparations but treat with Mercury.

JAW DISLOCATION

The surgeon having protected his thumbs with thick lint stands in front of the patient who is seated, pressing downwards and backwards on the last molar teeth with the thumbs, at the same time pulling forwards and upwards with his fingers below the jaw. When the condyles are clear, the strong muscles of mastication snap the jaw back into place. A four-tailed bandage should be worn for ten days. In recurrent cases removal of the intra-articular cartilage is frequently effective.

JAW FRACTURES—See article on Dental Surgery.

JAW, NECROSIS OF

This in India is nearly always due to a neglected alveolar abscess, the inflammation spreading from the alveolo-dental membrane to the periosteum and the bone, and is frequently very extensive on admission. Free incisions should be made down to the bone through the gums, free exit being given to the pus. An external incision may be required to open up the involucrum in extensive death of the bone. Fortunately the lower jaw reforms bone remarkably well. Necrosis due to Phosphorus, Mercury and Syphilis is now very rarely seen, but it may result from one of the acute exanthemata or from Cancerum Oris.

JAWS, TUMOURS OF—See Cystic Tumour in special article on Dental Surgery, and books on General Surgery.

JOINTS, ANKYLOSIS OF

This may be divided into:—

1. False or extra-articular due to Myositis Ossificans, reflex spasm of the muscles due to disease in the joint or adhesions around the joint.
2. True Ankylosis, *i.e.* within the joint which may be either bony or fibrous.

TREATMENT.—In attempting movement care is essential as there are several dangers to be avoided, such as fracture near the joint from atrophied bone, dislocation from shortening

of the ligaments, injury to large vessels and nerves from the same reason and in recent cases restarting the inflammatory process.

JOINTS, COMPOUND INJURIES OF

What has already been written with reference to the importance of compound fractures as surgical emergencies, applies with equal force to compound injuries of joints, and the same steps (Nos. 1, 2, 3 and 5 above) should be carried out and then:—

6. The joint cavity washed out with sterile Boric Acid solution.
7. The synovial membrane should be closed with catgut sutures, this being facilitated by mobilizing the membrane if necessary; but the closing of the synovial membrane is of first importance.
8. Intra-articular drainage must be avoided; the wound is closed in layers, but if infection is probable, a drain is carried down to, but not through, the sutured synovial membrane.
9. The limb is put on a splint, in such a position that should ankylosis occur, the patient will have the maximum utility.
10. After treatment, active movements and massage should be commenced as early as possible.

JOINTS, SUPPURATIVE ARTHRITIS—*See Arthritis, Suppurative.*

JOINTS, TUBERCULOUS DISEASE OF

Tubercular disease of joints occurring in children and recognized early is very amenable to treatment, but the prognosis is not so favourable as age advances. But given rest for the joint, good feeding and careful building up of the patient's powers of resistance, plenty of sunlight, fresh air and good nursing during a prolonged period of treatment, then operative treatment can generally be avoided and a cure brought about.

Heliotherapy, as carried out by Rollier and others, has given excellent results, the penetrating actinic rays raising the Hæmoglobin index, increasing metabolism and thus increasing the patient's resistive powers. There is no reason why Heliotherapy should not be practised in any part of India, but it is essential to think out a careful plan of treatment and not to over-expose.

KALA-AZAR

It has recently been found by Napier that Neostibosan or von Hayden 693, given in ten injections in the course of ten days, is an almost certain and complete cure for what were formerly very chronic and would have been fatal cases. The dose is 0.2 gr. the first day and 0.3 on the remaining nine days in a 25 per cent. solution either intravenously or intramuscularly.

Urea-stibamine, Stibosan and Stibamine Glucoside have been extensively used, all give more rapid results than the Potassium and Sodium Tartrate of Antimony, but as a rule their greater cost is prohibitive.

The Sodium Tartrate of Antimony is somewhat less toxic and irritant than the Potassium Salt. The solutions must be freshly prepared otherwise dangerous decomposition as shown by a white deposit may take place. The solution is 1 per cent. which equals 1 gr. of the salt in 8 c.c. of distilled water. The solutions are sterilized by boiling for half an hour and stored in rubber-capped bottles. The initial dose is $\frac{1}{2}$ gr., i.e. $1\frac{1}{2}$ c.c. and increased by $\frac{1}{2}$ c.c. per week up to a maximum of 2 or possibly 2.5 grains. The injections are given every three days as long as no toxic symptoms or excessive reaction occur. The toxic symptoms appear immediately after the injection and consist of a fit of coughing and nausea with subsequent fever. These signs do not necessitate a reduction in dose, but if actual vomiting occurs the next dose should be reduced. In children the initial dose is only $\frac{1}{4}$ c.c. and subsequently in proportion to body weight, the dose only being slowly increased as children respond well.

Cases insufficiently treated are liable to relapse and it is therefore important to recognize the signs of cure; these are clinically, absence of pyrexia for long periods with considerable gain in weight and a reduction of several inches in the size of the spleen. Laboratory tests are, disappearance of the leucopenia and absence of the parasite from cultures of the spleen blood taken by puncture both microscopically and after three weeks' culture. If a relapse occurs the full course must be repeated.

KELOID

Radium gives the best results. Bier's hyperemic method by suction cups followed by the application of Salicylate ointment is said to be effective. Of the other many forms of treatment recommended none are satisfactory.

KERATITIS—*See Diseases of the Eye.*

KIDNEY CALCULUS—*See* Calculus, Renal.

KIDNEY, MOVABLE

PALLIATIVE TREATMENT.—1. By rest and endeavour to increase the body fat, with the idea of making the kidney less mobile by a deposit of more fat around it.

2. By wearing mechanical apparatus, either a kidney truss or an abdominal kidney belt; these must be very accurately fitted and invariably applied when lying down.

No operative treatment should be performed if there is general visceroptosis or severe neurasthenia without symptoms referable to the kidney. It is most important that a patient should never be told she has a movable kidney, unless active treatment is essential. Operation will be necessary if undue mobility is causing disease of the kidney, or harmful pulling on other organs, or the patient has to perform manual labour and cannot afford a belt, but in all cases palliative treatment should be tried in the first place.

KNEE-JOINT, INTERNAL DERANGEMENT OF

Under this heading clinically are grouped all those cases characterized by recurrent attacks of sudden pain, usually followed by synovial effusion. The causes are: A small loose fragment of bone or cartilage, an osteo-arthritic osteophyte loose or on a fibrous pedicle, an hypertrophied or lipomatous synovial fringe, a loose melon seed body (concentric laminæ of fibrin).

Detachment or distortion of an intra-articular cartilage, generally the internal, stretching or rupture of the internal lateral ligament and most serious of all on account of the great disability and difficulty to cure tearing or separation of the anterior crucial ligament which normally prevents over-extension of the joint or the posterior which prevents over-flexion of the joint.

TREATMENT.—As regards a semilunar cartilage, if the patient has not already reduced it himself, an anæsthetic will generally be necessary; then fully flex the knee, rotate the leg outwards which opens the joint line at the same time exerting firm pressure over the cartilage.

Then suddenly extend the knee at the same time rotating the leg inwards. Subsequently special attention should be given to improving the tone of the quadriceps muscle by active exercises without weight bearing, *i.e.* jerking in the recumbent position and later bicycling and rest from weight bearing by the use of a knee truss. Usually however, repeated attacks call for

operation and if it has not been postponed so that the muscles and ligaments are permanently weakened, the results are excellent. But the whole cartilage must be removed, and any thickened synovial fringes dealt with. Loose bodies can generally be seen by X-rays; early removal is advisable otherwise changes take place in the joint. A wide view of the joint is often necessary and for this the quadriceps patella and ligamentum patellæ may be split longitudinally.

The prognosis in loose bodies and hypertrophied folds is generally less favourable than in dislocated internal semilunar cartilage, as the joint is frequently involved in osteo or rheumatoid arthritis. Ruptured crucial ligaments must be treated either by rest for 4 or 5 months or a knee splint with long side-irons for constant and permanent wear or free exposure of the joint by Robert Jones patella-splitting method followed by a difficult reconstruction operation as advocated by Hoy Groves.

KNOCK-KNEE

If there is active rickets this must be first treated by sunshine, fresh air, phosphates and cod-liver oil; no correction should be attempted until the active stage of rickets is cured. The treatment is either expectant by which the legs are massaged and the muscles strengthened by exercises and the deformity corrected by the hands for 15 minutes, three times daily. Good results will generally be noticed in a few months. If this is insufficient, splints will be required, the Thomas being most effective, the child walking about with the knee fixed in full extension. It is possible with splints to correct a separation of the malleoli of 5 inches in six months.

If after the age of 5 years in children the deformity is more than 3 inches or in adolescents 4 inches, operative treatment should be carried out preferably by Macowen's method at the lower end of the femur, and full correction is then obtained even though the tibia shares in the deformity.

LACHRYMAL APPARATUS, DISEASE OF—*See Diseases of the Eye.*

LARYNGEAL OBSTRUCTION

This may be due to secondary Diphtheritic infection from the pharynx or nose; primary is very rare. Acute Laryngitis especially at the onset of some cases of measles. Oedema from renal disease, following a burn or scald and from Potassium Iodide. Post-pharyngeal abscess, laryngeal crisis of tabes dorsalis, new growths and foreign bodies. In frequently recurring attacks of laryngeal obstruction without obvious cause Syphilis

should be suspected and treated; treatment of the other conditions is considered under their respective heads.

LACTATION

How to increase the flow of milk? There is a popular fallacy that milk taken by the mother is secreted as milk by the breasts. This leads to women taking milk between meals which ruins their appetite and causes indigestion. Stout and beer are thought to produce milk which probably correct from the ingestion of fluid. The patient's mental condition should be safeguarded by the avoidance of all worries, visitors and tactless statements on the part of the nurse. The following may be tried:—

R Tr. Jaborandi	m 80	or R Pituitary Extract $\frac{1}{2}$ c.c.	hypo-
Liq. Ext. Malti.	5iv		dermically once daily.
Spt. Chloroformi	m 8		
Aqua Cinnam ad.	3j		
t.d.s.			

How to stop the flow of milk? A tight binder round the chest put on after labour is very effective. Cere ointment (Yellow wax 1 and Olive oil 8) warmed and spread, then a binder, or Emplastrum Belladonna spread on thin leather. At the same time give concentrated saline purges. If the breasts swell and are painful, then withdraw about a drachm of milk which will give relief, but massage and prolonged use of the breast pump are wrong and harmful. Potassium Iodide in 20 gr. doses is useful.

LARYNGITIS, ACUTE—See Diseases of the Throat and Nose.

LARYNGITIS, CHRONIC—See Diseases of the Throat and Nose.

LARYNX, FOREIGN BODIES IN—See Air Passages and Oesophagus, Foreign Bodies in.

LARYNX, TUBERCULOSIS OF—See Diseases of the Throat and Nose.

LARYNX, SYPHILITIC ULCERATION OF—See Diseases of the Throat and Nose.

LARYNGEAL CARCINOMA—See Diseases of the Throat and Nose.

LEAD POISONING—*See* Plumbism.

LEISHMANIASIS—*See* Kala-azar and Oriental Sore.

LEPROSY, TREATMENT OF

By Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Revised May, 1934

In CHAULMOOGRA OIL and its derivatives we now possess an effective treatment of all early and of a fair proportion of more advanced cases of leprosy.

Chaulmoogra oil has for long been obtained from the seed of the Burma tree *Taraktogenos Kurzii*, and it contains chaulmoogric acid, hydnocarpic acid and the low melting point fatty acids known as gynocardic acid. The same substances are present in *Hydnocarpus Wightiana* oil from the Western Ghats of India, and in *H. Anthelminea* of Siam and Indo-China, and these latter contain more of the most active hydnocarpic and gynocardic acids, and less of the inactive chaulmoogric acid, are also easier to obtain pure, and so are to be preferred to that of the original Burma tree.

Chaulmoogra oil has been given orally in leprosy for several decades, but its nauseating qualities usually prevent its being taken in sufficient doses, such as 100 drops a day. O. E. Denny of the United States Leprosarium has recently reported the avoidance of nausea by putting up the oil in enteric capsules.

H. ANTHELMINICA SEEDS have been given fresh with *Cannabis Indica* in the proportion of three of the former to one of the latter in half drachm doses twice daily after food in adults and proportionately smaller doses for children, by E. O. Travers in the Malay States, this method being an old Chinese one, and he reports good results. It is a simple and rapid method, as the doses are measured in little aluminium cups, and is suitable for advanced cases not amenable to the more active measures described below.

SODIUM GYNOCARDATE AND HYDNOCARPATE INJECTIONS.—L. Rogers in 1916 reported promising results from the subcutaneous and intravenous injections of sodium gynocardate and hydnocarpate, made from the active lower melting point fatty acids of chaulmoogra oil, and recorded a number of recoveries in the following year with illustrations in the *Indian Jour. of Med. Research*. He also showed that intravenous injections led to slight general febrile, and marked local reactions in the form of swelling up and softening of the nodules, and he demonstrated that this was accompanied by breaking up

of the lepra bacilli into granules and their eventual disappearance with apparent cure. After five years' work he reported on 51 cases treated for three months or over with 40 per cent. completely cleared up, and another 40 per cent. greatly improved, the cases being mostly fairly early ones obtained from a hospital outpatient department. This method, although a very effectual one, had the disadvantage of producing obstruction of the veins at the sites of injection limiting its use.

ETHYL ESTERS PREPARED FROM HYDNOCARPUS OILS.—In 1919 H. T. Hollmann and A. L. Dean reported on the injection of ethyl esters of the fatty acids of *Hydnocarpus Anthelminica* oil, and this preparation has been used very extensively in the Philippines, Honolulu and elsewhere with good results, preferably with addition of 0.5 per cent. iodine and heating until brown to lessen the pain as used in Culion. Intramuscular doses gradually increased from 0.5 to 3 or 4 c.c. are given once or twice a week intragluteally.

Later Rogers introduced a cheap and unirritating preparation consisting of the sodium salts of selected fractions of the fatty acids of *H. Wightiana* under the name of 'Alepol' in a powder form, ready for making up 3 per cent. solutions with 0.5 per cent. carbolic acid. Full 5 c.c. doses can be given twice a week for a year at a cost of just over 2s. per case, and very favourable reports of its value have been received.

This preparation is nearly painless by subcutaneous and intramuscular injection, and 1 per cent. solutions can be given intravenously as a rule without vein trouble and with good effects. Moreover, E. Muir has found that 2 per cent. solutions can be given repeatedly into the veins without the slightest irritation or harm by the simple expedient of drawing up about as much blood from the vein as the dose into the syringe, mixing by rotating the syringe on its long axis with the needle in the vein and injecting the whole.

OTHER PREPARATIONS.—

Muir's H.C.O. Mixture.—Owing to ethyl esters being somewhat painful intramuscularly, Muir for long used his H.C.O. mixture consisting of equal quantities of pure *H. Wightiana* and olive oils, to which 1 per cent. creosote is added as an antiseptic, and sterilized by heating to 120° C. for half an hour. Dose 0.5 c.c. increased by 0.5 c.c. at each dose as long as no reaction occurs up to 10 c.c. intramuscularly, or up to 4 c.c. of any dose can be injected subcutaneously beneath lesions with advantage, and the rest intramuscularly.

Creosoted H. Wightiana Oil.—Muir also found that this oil obtained from fresh seeds can be injected in similar doses, 4

per cent. creosote being added, with sterilization as above. As it was less painful than the E.C.O. mixture, he has adopted it as his routine treatment, together with Alepol in similar doses as a change every month or two. All the preparations should be injected twice a week.

INTRADERMAL INJECTIONS.—Early in his investigations Rogers injected soluble preparations of the active fatty acids of Hydnocarpus oil directly into nodular lesions with benefit. This plan has been greatly extended by Philippine workers, and adopted by Muir and others, a drop of the ethyl esters for preference is being injected into the thickened dermal lesions at a number of points at a sitting, and the remainder, if any, of the dose being given is injected intramuscularly. Experience has shown that the macules and nodules clear up more rapidly under such direct treatment.

IODIDES AND ANTIMONY AND LEPRA REACTIONS.—It has long been known that potassium iodide orally may produce severe lepra reactions, and Muir thought that they might be beneficial in the third stage of the disease to hasten the process of resolution, but J. Lowe, working with resident leper patients, found the drug did more harm than good. On the other hand, E. Muir has found that intravenous injections of 0.02 grammes of tartar emetic in 8 c.c. sterile water every other day is beneficial in controlling the febrile reactions of the disease. He also advises active exercise and a good diet as important aids to progress.

In the eye complications of leprosy Krysolgan intravenously is of value as recommended by Hoffmann, beginning with very small doses, as in the treatment of tuberculosis with gold preparations, and gradually increasing them over eight doses at weekly intervals.

Surgical measures for the removal of dead bone, etc. are of great value.

PRECAUTIONS IN USING ACTIVE CHAULMOOGRA OIL DERIVATIVES.—Muir has pointed out that in early cases of leprosy, and also in chronic ones, which have ceased to show the febrile reactions of the acute stage, these treatments can be pushed with safety and advantage. In the active stage of the disease with much thickening of the tissues great caution is necessary lest harmful prolonged febrile and local reactions in the form of appearance of new lesions occur. The object to be aimed at is to get repeated slight local, with or without very slight febrile reactions, which result in destruction of the lepra bacilli and gradual development of immunity. After any reaction the injections should be stopped for a week or more until

the reaction has quite ceased, and the dose should not be increased as long as they recur.

Treatment should be continued for six months after all the lesions have cleared up, and the patient should be seen every three months for another two years in case of relapse.

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LEUCORRHŒA

Means the natural vaginal secretion but in excess, and it is essential to distinguish simple leucorrhœa from purulent or mucopurulent discharge due to infective conditions of the cervix or endometrium. Changes may be discovered in the cervix which account for the discharge, such as hypertrophy of the cervical mucous membrane, bilaterally torn and everted lips or an erosion. Antiseptic douches should be tried in the first place with general tonic treatment, this failing try solid nitrate of silver or pure carbolic. After preliminary treatment the electric or Paquelin's cautery may be applied two or three times at intervals of a week; but if improvement has not then taken place, further applications should be suspended as there is danger of starting carcinoma.

LEUKÆMIA

There are two main types: (1) Myelocytic or its older name Splenomedullary, and (2) Lymphocytic or lymphatic leukæmia.

In the first type the granular cells predominate polymorph-nuclear, eosinophil, basophil and myelocytes. In the second the differential count shows a great preponderance in non-granular lymphocytes, either of the large kind (acute) or small variety (chronic lymphatic leukaemia). Either of these conditions may be acute or chronic. Apart from these two well-defined types are several mixed types, in some of which myelocytic and lymphocytic cells are both increased, in others the blood picture shows evidence of pernicious anaemia, and in others again the bone and glands show greenish coloured metastases (Chloroma).

TREATMENT.—The cause is unknown. In the myelocytic acute type the disease runs a rapid course to a fatal termination in a few weeks. In the chronic type some improvement may occur from the combined use of Arsenic, X-rays and Radium, there are also natural remissions in the disease. In the lymphocytic acute type the course to a fatal termination is very rapid. In the chronic type no drug or medication can be said to ever delay the disease. Benzol, Iron, Arsenic and Manganese may be tried. Splenectomy is not justifiable in any form of leukaemia.

LICE—*See* Pediculosis.

LICHEN TROPICUS—(Prickly Heat)

Frequent baths and change of clothing are important. A solution of Carbolic 1 in 20 or Perchloride of Mercury 1 in 1,000 well rubbed in for a couple of minutes before getting into the bath is rapidly curative. After the bath the skin should be well dried and dusted with a powder of Boric Acid, Starch and Zinc Oxide.

LICHEN PLANUS

Internally Perchloride of Mercury 1/12 gr. t.d.s. or Arsenic.
Externally—

R Carbolic Acid	gr. 20	or R Liq. Picis Carbonis B.P.
Hydrarg. Perchlor.	gr. 1 to 5	Painted on the spot.
Ung. Zinci Benz.	3j	

LIGHT TREATMENT—*See* Heliotherapy.

LIVER ABSCESS—*See* Hepatic Abscess.

LIVER, ACUTE YELLOW ATROPHY OF

The preventive treatment in cases of Jaundice in which this condition is feared is the same as for Catarrhal Jaundice. Plenty of fluid should be given, alkalies and glucose pushed.

LIVER, CIRRHOSIS OF—*See* Cirrhosis of the Liver.

LIVER, WOUNDS AND INJURIES OF

Rupture of the liver is a very fatal accident and little can be done. Wounds of the liver, such as stabs, are difficult to deal with on account of the hæmorrhage sutures often cutting out, the best plan is to pack with dry gauze which is left in for four days.

LUDWIG'S ANGINA—*See* Angina Ludovici.

LUMBAGO—*See* Fibrositis.

LUNGS, ŒDEMA OF—*See* Cardiac Disease.

LUPUS ERYTHEMATOSUS

Internally gold preparations of which the best is Sanocrysin 0.01 gm gradually increased up to 0.1 gm. Externally one of the two following prescriptions:—

R Calamine	℥ss	R Zinc Sulphate	℥j
Zinci Oxidi	℥ss	Sulph. Præcip.	℥j
Acidi Borici	℥j	Pot. Sulphurata	℥j
Glycerine	℥j	Aqua Rosæ ad.	℥iv
Aquam ad.	℥vj		

Painted on three times daily.

LUPUS VULGARIS

Local light treatment by the Kromayer or Tinsén water-cooled lamps are of course effective, but an extensive case of lupus of the face requires two years' treatment. It is very expensive and Phototherapy is only to be found at a few centres in India. The simple methods that can be used by anyone will therefore be considered. It must be remembered in considering treatment that Lupus presents many clinical varieties, due to various complicating and secondary changes.

In the primary or apple-jelly stage the aim is to eliminate the tubercle bacillus and, if practical, excision is the best method. The next or caustic treatment is very painful, this can be effected by Hebra's paste or Unna's salicylic creosote plaster. Then there is the Acid Nitrate of Mercury treatment by which a spicule of wood is dipped in the remedy and bored into each individual nodule, one or two applications being necessary, but this is not suitable for the face on account of the scarring.

Early cases can sometimes be cured by drugs applied in Collodion, as:—

R Saponia Viridis	...	...	gr. 45	2 parts
Acid Salicylic	...	...	gr. 45	2 parts
Collodii Flex.	...	...	3vjss	20 parts
R Ichthyolis	...	...	3ij	5 parts
Collodii Flex.	...	...	3j	20 parts

Pyrogallie Acid sometimes does good.

R Pyrogallie Acid	...	...	...	3 ii to iii
Vaseline	...	...	...	3j
Resin	...	...	...	3j

The ointment is spread on lint and applied, being changed twice daily.

CATARRHAL LUPUS.—This is the stage when there is a superimposed infection with micro-organisms, the simplest and most effective treatment is the use of the sharp spoon which at once removes all the soft and friable tissue. If for any reason the operative treatment cannot be carried out, the same end can be achieved much more slowly by antiseptics. Almost any antiseptic will do, but the following known as Brook's ointment is useful:—

R Zinci Oxidi	3ij	R Thyroid Extract	3 to 6 gr. daily.
Pulv. Amyli	3ij		
Vasolini Albi	3ss		
Ung. Hydrag. Oleat. 5%	3j		
Acid Salicyl.	gr. 20		
Ichthyol	m 20		
Ol. Lavandulæ	q.s.		

FIBROID LUPUS.—The difficulty in this case is the excessive growth of fibrous tissue, which must be removed before it is possible to attack the lupus directly. Scraping is useless, and it must be removed by repeated counter-irritation with Carbolic Acid or Acid Nitrate of Mercury.

LUPUS CARCINOMA.—This occurs much more frequently than formerly and X-ray treatment must be held responsible.

The general treatment of the lupus patient is important and the rules for the treatment of tuberculous patients apply to those suffering with the disease located in the skin. There is no specific internal remedy.

LYMPHADENOMA

Many conditions will cause a chronic enlargement of lymphatic glands, for example, enlarged glands in the groin may be due to carrying keys in the trouser pocket. The common causes of enlarged glands are:—

Secondary Syphilis.	Lymphatic Leukæmia.
Tubercle.	Hodgkin's Disease.
Plague.	Lymphadenoma.
General Skin Sepsis.	Lymphosarcoma.
German Measles.	

The important point in the diagnosis is to exclude tubercle. If any doubt exists, a gland should be excised, half examined under the microscope and the other half implanted into a guinea-pig.

MALARIA, THE TREATMENT OF

Revised by Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

May, 1934

The salts of Quinine generally used are:—

- (1) QUININE SULPHATE is the cheapest form, but is only soluble 1 in 800 of cold water, it is easily soluble if $1\frac{1}{2}$ m of dilute Sulphuric Acid are added for each grain of Quinine. It is the salt most generally used, but is often adulterated with lime, starch and magnesia.
- (2) QUININE HYDROCHLORIDE is more expensive, and more soluble, 1 in 40 of water, and has a higher alkaloid strength—81.71 as compared with 74.31 of the Sulphate.
- (3) QUININE BIHYDROCHLORIDE is soluble 1 in 1 part of water, generally used in intramuscular and intravenous injections.
- (4) QUININE HYDROBROMIDE has been found valuable for long continued use; it is less irritating to the stomach than the Sulphate, and is well adapted for hypodermic use.
- (5) QUININE BIHYDROBROMIDE is soluble 1 in 7 parts of water; this salt, or the Bihydrochloride, is generally used in intramuscular and intravenous injections.
- (6) QUININE BISULPHATE is soluble 1 in 11 parts of water.
- (7) EUQUININE.—Quinine Ethyl Carbonate is very soluble; this salt and the Tannate are not nearly so bitter as the other salts, and are frequently given to women and children. It is very expen-

sive, and should be given in somewhat larger doses than the other quinine salts, either in powder, followed by an acid drink, or with Aromatic Syrup.

(8) QUININE TANNATE is very insoluble, and is only used for prophylaxis in children, made up with chocolate.

(9) QUININE VALERIANATE is used only in hysteria, and allied nervous conditions.

METHODS OF ADMINISTRATION.—

I. BY THE MOUTH.—(1) By powder, the cheapest methods, and is useful for prophylaxis.

(2) In solution, the Sulphate dissolved with acid is cheap and efficient. The Bihydrochloride or the Bisulphate can be given dissolved in water. Hot water must be used to dissolve the Hydrochloride. Quinine in solution should be given in all acute cases.

(3) In pill, must invariably be freshly made, if the pills are old and hard they are useless. Pills are best made from the Sulphate or Hydrochloride with a little water and a small crystal of Tartaric Acid.

(4) In tabloids, are useful for travelling and are generally made of Hydrochloride or Bisulphate. Tabloids should always be broken up before being swallowed, and followed by a drink of acidulated water.

Note.—Tabloids and pills often escape solution, and absorption, and are not reliable.

(5) By capsulo or cachot;—

R Quinine Hydrochlor., 10 gr., in gelatin capsulo, swallowed with—

R Acid. Hydrochlor. Dil.	...	...	m 15
Aquam ad.	...	...	3ij

Much depends on the method of administration; by the mouth should be the routine method, and a course of quinine should always be preceded by a free purge of Calomel; this relieves the liver and assists the absorption of the quinine, which is very soluble in bile; if the patient cannot take Calomel, other cholagogues as Podophyllin, Euonymin or Tridin can be used alone, or combined.

A. J. Sinton has found that the action of quinine is enhanced by the administration of alkalies in the form of Sodium Bicarbonate.

Strong solutions of quinine are very irritating to the stomach; this is best avoided by ordering quinine directly after a meal.

Quinine for prophylactic purposes is best given after the last meal of the day, as it makes many people sleep soundly, and there is no inconvenience from buzzing in the ears, etc. -

Smaller doses are required if the quinine is dissolved in Citric Acid or Lime Juice, or if an effervescent form is prescribed.

In chronic cases, especially those habituated to alcohol, the absorption of quinine is greatly favoured by combining it with a little Capsicum—about 1 gr. per dose.

Children with malaria stand quinine well: infants under one year can be given 3 to 5 gr. daily in small doses.

Quinine must not be withheld from pregnant women, but should be given as sparingly as consistent, together with Ext. Hyos.; if uterine contractions commence Opium should be given.

II. BY THE RECTUM.—This method has been recommended in comatose cases and for malarial convulsions in children, but W. Fletcher in the Malay States found by testing the urine for quinine that the drug is not well absorbed from the rectum, and that it may produce dysentery-like symptoms with extensive sloughing of the mucous membrane; so he advises strongly against this mode of administration, which is far inferior in cerebral cases to the intravenous method, for he found that after a few week's administration of rectal quinine, malarial parasites were still present in the blood in 11 of 16 cases.

III. SUBCUTANEOUSLY.—Quinine should never be given subcutaneously, as it nearly always results in sloughing and ulceration.

IV. INTRAMUSCULAR INJECTIONS.—These should be used when oral administration is not possible; and for severe chronic infections and pernicious forms, especially of the abdominal type. Most solutions cause pain. The following points must be carefully attended to: The skin, syringe, and solution must be absolutely sterile; the injection must be made very deeply into muscle, otherwise sloughing will occur; the solution must not be concentrated, but freely diluted, and the site of injection must be well massaged to diffuse the solution. The following solutions can be used:—

R Quinine Bihydrochloride 10 gr., dissolved in Distilled Water.

Rogers states: 'Personally I have found Cinchonine Bihydrochloride to be far less irritating to the tissues, and much

more rapidly absorbed than the quinine salt; and always use it in preference to the latter. The fact that it will produce cinchonism in a short time, which quinine injections never do, in my experience, shows this.'—Sir L. Rogers' paper on the subject, in *B.M.J.*, Oct. 26, 1918

He gives intramuscular injections of 10 gr. of cinchonine bihydrochloride daily for four days, followed by quinine orally in cases of severe malaria with vomiting, making it difficult to get in enough quinine by the mouth and he considers it almost as effective as quinine intravenously used in the strength of one-half of a gramme ($7\frac{1}{2}$ grains) in one c.c. sterile water, put up in capsules and sterilized in an autoclave.

V. INTRAVENOUSLY.—When rapidity of action is all-important, as in cerebral comatose, or pernicious cases, quinine should be given intravenously.

10 grains of either quinine, cinchonine bihydrochloride or acid hydrobromide can safely be given in 10 c.c. sterile saline with a 10 c.c. syringe if injected very slowly, one minute by the watch for every one c.c. of the solution.

REFERENCE

Paper by Rogers on Intravenous quinine and cinchonine. *B. M. J.*, Sept. 22, 1917, p. 241.

QUININE PROPHYLAXIS.—(1) Recent work on the quinine treatment of artificially induced malaria in general paralytics has shown that the drug must be continued for at least ten days after infection by the bites of infected mosquitoes if an attack is to be averted, so the drug acts by destroying the parasites in the blood, and not by preventing mosquito infection. It is none the less essential for those living in highly malarious places, as in many parts of tropical Africa, as even when it fails to avert attacks, it renders them far less dangerous, and so quinine should be taken regularly during the malarial seasons in such places.

(2) Quinine Prophylaxis, to be successful, should be based on the following principles:—

- (a) A sufficient dose should be given to kill all the invading parasites, so as to avoid the danger of any quinine-resisting forms surviving, and making the fever more difficult to cure. For this purpose not less than 10 grains are indicated.
- (b) The intervals between the doses should not exceed two days less than the mean incubation period of the most rapidly developing form of malaria present. This will almost invariably be the malignant tertian

variety, with a mean incubation period of six days, and a minimum of two days. The interval should, therefore, not be less than four days; and if an epidemic is present, this should be reduced to two days.

- (c) The prophylactic doses should be given on two consecutive days, as a rule, so as to act on the stage most amenable to quinine, of each brood of a double infection.

(3) The causes of the frequently reported failures of the most commonly employed methods are:—

- (a) In the case of Koch's bi-weekly doses on two consecutive days, with a five-day interval, that the interval is too long in the case of malignant tertian malaria, especially when of a virulent form.

- (b) In the case of daily 5-grain doses, that the dose is too small, to be certain to destroy all the parasites.

(4) To be effective as a prophylactic against malaria, quinine should be given in not less than 10-grain doses, on two consecutive days, with an interval of not more than four days without the drug. And in highly malarious places the interval should be reduced to two days, and the dose increased to 15 grains. Ten grains every other day has also proved successful in Gill's hands.

The conclusions of the Liverpool School of Tropical Medicine, on the results of interrupted, and continuous quinine administration, in resistant benign tertian cases, are:—

That the interrupted treatment with quinine, grains 30 or 45, twice weekly, is preferable to continuous treatment with quinine, i.e. grains 30 to 45, seven times weekly. Grains 45 twice weekly is better than grains 30, twice weekly; or than grains 30 daily, both as a palliative and as a curative treatment.

When the dose given on each of the two days reaches grains 45 or more, a curative effect is manifest. This becomes more marked as the dose is increased from grains 45 to grains 90. The maximum dose of grains 90, on each of two consecutive days, prevents 62 per cent. of cases relapsing, within an observation period varying from 53 to 165 days.

ECONOMY OF QUININE.—The Interrupted treatment requires, over any given period, only two-sevenths of the quantity of quinine required for the corresponding Continuous treatment.

THE ACTION OF QUININE.—Quinine acts most effectively on the merozoites, probably because they are free in the

plasma, next on the trophozoites and schizonts. It will not stop the sporulation of the full-grown and mature parasite. It has no effect on the gametocytes, except perhaps the younger forms, and no direct destructive action upon crescents.

TREATMENT OF THE ATTACK OF MALARIA.—Quinine cannot cut short a commencing Malarial paroxysm; and if given after the rigor has commenced, only increases the patient's distress. The following powder will relieve the headache and other distressing symptoms:—

R Pyramidon 5 gr., or Xaxa or Aspirin 7 gr.
Phenacetin 8 gr.
Cit. Caffein 3 gr., for one powder.

One powder to be given with a cup of very hot tea; at the same time cold applications should be applied to the head, and a hot-water bottle to the feet.

The best treatment for ordinary Acute Malaria is to give, for an adult, 10 gr. three times daily, always in solution, without regard to the conditions of the parasite. In cases of mild quartan and tertian fevers, very good results are obtained by giving the drug before the sporulation of the parasite is due, *i.e.* four hours before the attack; or 10 gr. in the morning, and another 10 gr. four hours before the attack is expected.

OTHER METHODS OF TREATING MALARIA.—As Rogers remarks, the effect of quinine on the malarial parasite is perhaps the most remarkable example of the specific action of a drug in the whole range of medicine, and one which has stood the test of two and a half centuries. Patrick Manson's opinion is that, in serious cases, to use any drug, to the exclusion of quinine, is culpable trifling.

Warburg's Tincture is certainly efficient in some cases; but this, as pointed out by MacGillchrist, is due to the combination of quinine sulphate, and cholagogues, the latter assisting in two ways: first, in that quinine is very soluble in bile, and secondly, in counteracting the extra work put on the liver, by the hemolytic action of quinine.

Methylene Blue, 2 gr. every four hours, has been recommended; and Thompson states that 12 gr. daily reduces the number of crescents, by some direct destructive action, but it is not nearly so efficient as quinine, although of value in the rare cases of serious idiosyncrasy to quinine. Picric Acid, 2 gr., two or three times daily, by the mouth, has also been recommended for the destruction of crescents.

Intravenous injection of Tartar Emetic, and intramuscular injections of Amylopsin and Trypsin are of no value.

Salvarsan, Neosalvarsan, Chitonin and Amochin are not

satisfactory. Dihydroquinine Hydrochloride is said to have a specific antimalarial action.

PLASMOQUIN or plasmochin is a rather expensive synthetic drug which is toxic and produced cyanosis and methæmoglobinuria in the doses first advised by its German sponsors. It acts well in benign tertian and quartan fever, but is not reliable in the malignant tertian form. It has, however, an advantage over quinine in that it destroys the gametocytes, and especially the crescent bodies, and thus renders the patient's blood uninfected to mosquitoes. It is now given in 0.02 to 0.03 gramme doses daily combined with quinine in malarial fevers. It is also recommended as a prophylactic to lessen the incidence of malaria among labour forces in highly malarious area by rendering their blood uninfected to mosquitoes, and W. W. Clemeshaw advises 0.01 gramme daily for this purpose.

ATLEBRIN is another synthetic preparation having a similar action to quinine, and not acting on the gametocytes. The daily dose is 0.8 gramme ($4\frac{1}{2}$ grains) in one dose or in divided ones, and continued for five to seven days. It is said to be more curative in that relapses are fewer after its use than after quinine, and it is non-toxic except for harmless yellow staining of the skin for a few days after full doses. Owing to the smaller amount required it is not more expensive than quinine, and it is probably safer to use in blackwater fever cases, so it promises to be a valuable addition to our anti-malarial drugs.

The following prescriptions are recommended:—

Quinine in an alkaline effervescing Saline Draught:—

R Quinine Hydrochlor.	gr. 10	R Quinine Sulph.	gr. 1 to 3
Syrup Lemon	ʒiiss	Acid Citric	gr. 10 to 15
Aqua Chloroformi .ad.	ʒi	Sacchari Lactis	gr. 10
		Misce, fiat pulvis.	

Dissolve in a little Water and add to the following:—

<i>Chronic Malarial Cachexia</i>			
R Quinine Bihydrochlor.	gr. 1½	R Pot. Bicarb.	gr. 15 to 20
Arsenic Trioxidi	gr. 1/64	Amn. Carb.	gr. 3 to 5
Ferri Citratis	gr. 2½	Syrup Aurantii	ʒi
		Aqua ad.	ʒi
		(Burney Yeo.)	

Anæmia following Malaria

R Quinine Sulph.	gr. 2½	<i>For Pregnant Women</i>	
Ferri Reducti	gr. 1	R Quinine Hydrochlor.	gr. 4½
Strychnine Sulph.	gr. 1/80	Ext. Hyos.	gr. ½
Arsenic Trioxido	gr. 1/64	For one pill.	

For one capsule.

MALARIA IN CHILDREN.—During an attack, children may develop convulsions, which are sometimes followed by stupor or coma; attacks may be severe, but children stand quinine well.

The following dosage table is taken from 'Tropical Medicine' by Castellani and Chalmers:—

<i>Age of Child</i>	<i>Dose of Quinine</i>			<i>No. of Doses in 24 Hrs.</i>
Under 12 months	...	$\frac{1}{2}$ to $1\frac{1}{2}$ grains	...	... Six.
1 to 3 years	...	1 to 2 grains Six.
3 to 10 years	...	2 to 3 grains Six.
10 to 16 years	...	3 to 5 grains Six.

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MALTA FEVER

Serum treatment has not been successful. Vaccines are sometimes useful in cases of long duration, but they must not be given when the temperature is high or in the acute stage.

No drug has any specific effect, quinine and salicylates are useless, and the former is actually harmful in large doses. Tepid sponging is necessary when the temperature is over 103° and belladonna liniment or fomentations for the painful joints. Recently Acriflavin 0.1 to 0.4 gramme given intravenously every third day has been reported to bring down the fever in a week or ten days, this treatment is still under trial.

MARASMUS

Wasting in infants apart from gross organic disease such as congenital syphilis, congenital pyloric stenosis, congenital heart disease or tuberculosis is becoming less and less frequent as general management and care of infants improves. In the treatment of these cases general hygiene is of the first importance, a nurse giving up her whole time to the case; cleanliness, warmth, fresh air and sunshine with correction of diet and sufficient quantities of vitamins are essential. Some unexpected cases recover after a prolonged struggle, but there are cases which no skill can save.

MEASLES

The infectivity is high, at least 4 days before the appearance of the rash, the infection is from person to person by the respiratory tract.

The patient is kept warm in bed in a well-ventilated room, on a milk diet diluted with barley water. The eyes should be shielded from bright light and Boric lotion used, if there is much conjunctivitis. One of the following should be given:—

R. Pot. Antim. Tart.	...	...	gr. 1/30
Liq. Ammon. Acet.	...	...	m 20
Syrup Tolu.	...	...	m 15
Aquam ad.	...	...	3j

Every 4 hours for a child of 5 years.

R	Liq. Amm. Acet.	...	...	m	20
	Pot. Nitrates	...	...	gr.	3
	Vinum Ipecac	..	...	m	3
	Syrup Limonis	..	...	m	20
	Aquam ad.	...	...	...	5ij

Every 4 hours for a child of 5 years.

A Chlorate of Potash mouth-wash should also be prescribed.

MÉNIÈRE'S DISEASE—*See* Vertigo, also article—Recent Advances in Medicine

MENINGITIS

The most useful classification is based on the nature of the infection:—

- | | |
|---|---|
| 1. Tuberculous. | 4. Pneumococcal. |
| 2. Syphilitic. | 5. Suppurative or Pyæmic. |
| 3. Meningococcal or Cerebro-spinal fever. | 6. Serous, no definite evidence of infection. |

The three forms—Tuberculous, Pneumococcal and Suppurative—are very fatal and little can be done as regards treatment. All cases require very careful nursing; absolute rest on a water-bed, with freedom from any external source of irritation, the room being kept dark. Attention must be given to the care of the skin and prevention of bed-sores, and a watch kept on the bladder and rectum. The bowels should be kept open, headache treated with analgesics, such as Aspirin and Phenacetin, and restlessness and insomnia with sedatives and hypnotics.

Lumbar, Cistern and Ventricular punctures are often of great value, not only in treatment, but also in diagnosis. The former is now widely practised and is useful in treatment not only to remove cerebro-spinal fluid under increased tension, but also to inject sera and antiseptics into the subarachnoid space.

TUBERCULOUS MENINGITIS.—Hexamine should be given in large doses. Tuberculin is useless and no drug is curative.

SYPHILITIC MENINGITIS.—The treatment is identical with the treatment of syphilis of the nervous system.

MENINGOCOCCAL MENINGITIS.—The general management and nursing are on the same lines. The treatment is specific or curative by means of lumbar puncture and administration of antisera; occasionally a simple lumbar puncture has been followed by rapid cure, but this is exceptional and cannot be relied upon alone, but it certainly relieves the nervous symptoms of headache, etc. The early administration of serum is as important as in diphtheria and must be given early. When the condition is a pus septicaemia the meninges not being involved

give from 20 to 50 c.c. intravenously or intramuscularly daily until the temperature comes down.

If the cerebro-spinal system is also infected, give the same dose intravenously or intramuscularly, then perform lumbar puncture removing 30 to 50 c.c. of cerebro-spinal fluid, the amount depending on the time the patient has been ill, and whether symptoms of shock or embarrassed respiration appear during the operation, then inject 10 c.c. less than the quantity of cerebro-spinal removed of antimeningococcal serum carefully warmed to body temperature. This is repeated daily until the symptoms abate and then on alternate days.

PNEUMOCOCCAL MENINGITIS.—Is rapidly fatal and no form of treatment is of any use except perhaps repeated lumbar puncture.

PYOGENIC MENINGITIS.—The infection is usually from the skull, scalp or middle ear. If a focus of infection can be reached and thoroughly treated the prognosis is more hopeful, but is usually rapidly fatal.

SEROUS MENINGITIS.—Repeated lumbar punctures and the use of intravenous hypertonic solution are indicated to reduce the tension.

MENOPAUSE

For the vasomotor disturbances, such as flushings, perspiration and headaches, Bromides are most effective.

℞ Amm. Bromide	gr. 10	or	℞ Amm. Bromide	gr. 15
Tr. Digitalis	℥ 8		Tr. Nux Vom.	℥ 4
Elixir Amantii	3ss		Sp. Amm. Aromat	℥ 20
Aqua Amantii ad.	3ss		Inf. Gentian Co. ad.	3ss
t.d.s.p.c.			Before meals t.d.s.	
℞ Amm. Ichthyol	gr. 5		℞ Ovarian Extract	gr. 5
In pill t.d.s.			In tabloid t.d.s.	

This is very useful in many cases. On the whole has been disappointing.

MENORRHAGIA

This is a symptom and not a disease, therefore the most careful and complete examination must be made to discover the cause. The following causes should be thought of:—

1. Acute Infectious Diseases, such as Small-pox, Scarlet fever, Measles, Enteric, etc.
2. Circulatory System.—Uncompensated valvular disease, Cirrhosis of the liver, Endocrine disturbance, Passive hyperemia from constipation, sewing machine work, tight-lacing.

High Blood Pressure and Arterio-sclerosis.

Blood Diseases—Leukæmia, Purpura, Scurvy, Hemophilia.

3. Generative System.—Endometritis, Fibromyoma, Retroversion, Retroflexion, Subinvolution, Polypus, and Salpingo-oophoritis.

4. A single excessive period may be due to:—

(a) Chill—a cold bath.

(b) Violent emotion and fright.

(c) Excessive exercise, riding, dancing, gymnastics, sexual excess.

The cause in each case must be sought and treated, but in severe cases, especially when the patient is becoming anæmic, other measures failing hysterectomy or sterilization by X-rays or Radium will have to be considered. The following prescriptions have been found useful in simple cases:—

R Ext. Hydrastis	gr. $\frac{1}{2}$	R Pot. Bromide	gr. 10
Ext. Hamamelidis	gr. 1	Liq. Ext. Ergot.	℥ 30
Ext. Ergotæ	gr. 1	Tl. Digitalis	℥ 5
Ext. Cimicifugæ	gr. $\frac{1}{2}$	Aqua Ament. Flor. ad.	℥ 31
One pill; t.d.s.		t.d.s. in water after food.	

R Styptol $\frac{1}{4}$ gr. in tablet.

MENSES, RETENTION OF—*See Amenorrhœa.*

METATARSALGIA (Morton's Disease)

Characterized by severe neuralgic pain in the forepart of the foot, most common in women, often bilateral and invariably associated with the fourth toe.

TREATMENT.—Wide shoes with a transverse strip of leather across the sole at the level of the heads of the metatarsal bones, massage and improvement of the muscular tone of the foot for anterior arch support. These measures failing, excise the head of the fourth metatarsal bone.

METEORISM—*See Flatulence.*

METRORRHAGIA

Hæmorrhage from the uterus between the menses, but the term should be limited to irregular hæmorrhage during menstrual life. The cause must be ascertained and treated; this may be due to Growths, either malignant or benign Fibroid, Polypus, Inflammatory, Endometritis, Erosions, High Blood Pressure, Blood Diseases, Endocrine Disturbance and Deficient Calcium.

MIGRAINE

An hereditary instability of the nerve centres, which react to stimuli which would pass unnoticed by a normal nervous system. This disease generally tends to improve with advancing years. Practically every case has an error of refraction which should be corrected. Every attack is associated with gastrointestinal symptoms and in severe cases vomiting may be marked. In my experience an attack may be provoked by eating chocolate, cocoa, eggs, acid fruit especially apples, strawberries and oranges; other causes are over-work, both mental and manual, and stooping. Sir William Gowers believed in the following mixture taken over an extended period:—

R Sod. Bromide	gr. 10	R Luminal	gr. 1 to 1½
Tl. Gelsemium	m 10	At bed-time. In more severe cases	
Liq. Strychnine	m 5	morning and evening.	
Liq. Tinitini	m 1	It is certainly of benefit in some	
Acid Hydrochlor. Dil.	m 5	cases but not in all.	
Inf. Gentian ad.	℥ss		
In water after food morning and evening.			

Finding and treatment of a septic focus is often effective. In all cases the diet should be carefully regulated at regular hours with ample vitamin content, exercise in the open air and avoidance of worry.

FOR THE ATTACKS.—A very hot bath and a purge, but this must not be Calomel as all migraine patients are very upset by this drug, later a dose of alcohol and then hot tea. Analgesics are often ineffective.

MITRAL DISEASE—*See Cardiac Disease.*

MOLES

Moles differ from warts in the absence of a papilliform surface, the growth lying beneath the surface epithelium. The pigmented variety may give rise to melanotic carcinoma, while the non-pigmented kind are frequently the starting point of rodent ulcer. If moles are in a position exposed to irritation they should be removed, even if not showing any sign of activity. This may be done either by the knife or CO₂, the latter is very effective, the length of application and degree of pressure depending on the amount of pigment and tissue in the mole.

MOLLUSCUM CONTAGIOSUM

If the lesions are only a few, they should be cut off with scissors. If the lesions are grouped together, X-rays is effective.

Another treatment is to stir up the contents of each lesion with needle dipped in carbolic acid

MORPHIA HABIT—*See* Drug Habit.

MORTON'S DISEASE—*See* Metatarsalgia.

MOSQUITO BITES

Should be prevented by mosquito-nets. The following applications are effective in prevention:—

R Olei Carophylli	℥ss	R Citronella Oil	℥j
Olei Bergamotæ	℥ss	Vaseline	℥ij
Olei Lavandulæ	℥jss		
Olei Terbinthinæ	℥ij		
		R Quinine Sulph.	gr. 20
		Spiritus Vini Rect.	℥viij
		Aquam ad.	℥j

The irritation of the bites is best relieved by Liq. Ammoniac applied without friction.

MOVABLE KIDNEY—*See* Kidney, Movable.

MULTIPLE SCLEROSIS—*See* Disseminated Sclerosis.

MUMPS

Local applications are as a rule not of much value, but hot fomentations or Glycerine and Belladonna may be tried. Feeding may be difficult, but can generally be done out of a feeding cup with a spout; a mouth-wash should be prescribed. Apart from orchitis there is no other sequela or symptom of importance. The patient should be put to bed and any erotic excitement avoided; nearly 50 per cent. of orchitis cases progress to complete or nearly complete atrophy of the testis, but fortunately is seldom bilateral.

MYCOSIS FUNGOIDES

The cause is unknown, in some cases it resembles sarcoma but there are never metastases. The only treatment which is very effective is X-rays.

MYOCARDIAL DISEASE—*See* Cardiac Disease.

MYXŒDEMA

It is important that only small doses of thyroid should be given at first, 5 m of the Liquor or $\frac{1}{2}$ gr. of the dry thyroid at bed-time, the dose being gradually increased up to 10 m or

1 gr. of the dry thyroid (5 gr. of the fresh gland). The patient may then be allowed to get up. The nature of the treatment should be explained to the patient and the necessity for continuance during the rest of life.

NÆVI—*See* Moles.

NAIL, INGROWING—*See* Toe-nail, Ingrowing.

NASAL CATARRH—*See* Catarrh, Acute Nasal.

NEPHRITIS

ACUTE NEPHRITIS.—In this condition the kidneys are inflamed and the renal cells paralyzed with toxins. We cannot directly treat the kidneys, but much can be done to relieve their work by changing the diet and limiting the intake. The best diet is a pint to a pint and a half of milk with some cooked rice or tapioca. Gradually as the œdema disappears and the patient begins to recover more and more carbohydrate and fat may be added. In the average case a moderate amount of fluid should be given, but large quantities should not be given with the idea of washing out toxins. When œdema is persistent and intense, the diet should be salt-free. Diuretics are not of much good, as one of the best diuretics is already in excess in the blood, but the following prescriptions may be tried:—

R Pot. Acetate	gr. 20	or R Liq. Amm. Acet.	3ij
Tr. Squill	℥ 10	Amm. Benzoate	gr. 10
Sp. Nitrous Ether	℥ 80	Tr. Hyos.	3ss
Succus Scoparii	3j	Dec. Scoparii ad.	3j
Aquam ad.	3j	In water every 4 hours.	
Every 4 hours.			

ŒDEMA.—The best way of dealing with troublesome œdema is free purgation—R Pulv. Jalapæ Co. gr. 40 to 60.

VOMITING.—This may be very troublesome and may be due to the ascites or actual œdema of the stomach wall. Tapping the ascites should be tried and Acid Hydrocyanic Dil. or drop doses of Tr. Iodi or Liq. Carbolic Acid.

SUBACUTE PARENCHYMATOUS NEPHRITIS.—The dominating symptom in this condition is the accumulation of excessive fluid in the tissues, and the object of treatment is to get rid of this fluid and endeavour to prevent its reaccumulation. This frequently can be done by diet, but before deciding on a special diet it is advisable to estimate the functional capacity of the kidneys by the modern renal tests. For example, if the blood and urine urea content are normal, the best results

will be obtained with a liberal diet. The fluid intake should be restricted and the food salt-free. Diuretics with the exception of urea have little effect; large doses, such as the following, are frequently more rapid than smaller doses. It is non-toxic and no unfavourable symptoms follow its administration:—

R Urea	...	...	...	3iv
Tr. Auranti	...	...	...	m 15
Aquam ad.	...	...	...	3ij
Twice daily.				

The bowels must be kept loose. The presence of fluid in the chest or abdomen may make tapping essential. Southey's tubes may be necessary for the legs in some cases, but there is always the danger of the punctures becoming septic or refusing to heal.

If the Hydræmia is associated with a weak heart, the following is useful:—

R Tr. Scillæ	m 10	R Pot. Acetate	gr. 15
Tr. Digitalis	m 5	Liq. Ferri. Acet.	m 15
Inf. Scoparii ad.	3j	Liq. Amm. Acet.	3ij
t.d.s.		Syrup Lemon	3j
		Aquam ad.	3ss
t.d.s.p.c.			

In very obstinate cases decapsulation of the kidney has been carried out. But if the kidney function as regards nitrogenous excretion is impaired or there are inflammatory lesions, decapsulation may do more harm than good.

CHRONIC INTERSTITIAL NEPHRITIS.—Treatment in this condition is even less satisfactory than in the acute and subacute. The patient should lead a quiet regular life, keeping the bowels and skin acting freely, avoiding chills and over-exertion. The lesions may be slow in developing and the aim should be to keep the general health at as high a standard as possible. Functional tests being made to ascertain if there is any increase of blood urea, or decrease of urea concentration and this is the only means on which an intelligent dieting of the patient can be based. The famous Guy's pill may be useful in these cases:—

R Pulv. Digitalis	gr. 1	or R Pot. Acet.	gr. 15
Pulv. Scillæ	gr. 1	Pot. lod.	gr. 3
Pil. Hydiarg.	gr. 1	Spt. Juniper	m 30
Ext. Hyos.	gr. 1½	Spt. Chloroform	m 10
t.d.s.		Inf. Uvæ Ursi ad.	3j
		t.d.s.	

The High Blood Pressure should not be lowered as it is necessary to maintain renal action, but Sodium Nitrite or Amyl

Nitrite may be necessary for the headache or if less severe a combination of Tr. Cannabis Indica and Pot. Bromide which drugs are also useful for the restlessness.

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NERVES, DIVIDED—See Divided Nerves.

NEURALGIA

May be defined as a sharp shooting paroxysmal pain occurring in a nerve, nerve root or plexus without structural alteration in the nerve. The causes may be:—

1. Toxic:—poisons such as alcohol, gout, diabetes, syphilis, malaria, etc.
2. Anæmia from any cause.
3. Reflex Neuralgias—from dental conditions, ear, nose, eye, also constipation.
4. Actual disease of sensory ganglia, or nerves pressed on by scar tissue, callus, tumours or cervical ribs.
5. Organic Disease of the Central Nervous System as Tabes.
6. Psychological Neuralgias.

In the first place a thorough examination must be made to ascertain the cause if possible and remove it, as for example, dental caries, unerupted wisdom teeth, disease of one of the sinuses, an error of refraction or glaucoma. Next the general health must be attended to, constipation removed and if there is any anæmia treated with a prescription, such as:—

R Ferri Quinine Cit.	...	...	gr. 20
Liq. Arsenicæ	...	...	℥ 5
Tr. Nux Vom.	...	...	℥ 5
Aqua Aurantii Flor. ad.	...	...	℥ss
t.d.s. after food.			

ACUTE FACIAL NEURALGIA.—Butyl Chloral and Gelsemium are especially efficient in this form of neuralgia.

℞ Butyl Chloral Hydras	gr. 10	℞ Sod. Salicylate	gr. 12
Gelsem. Hydrochlor.	gr. 1/64	Sod. Iodide	gr. 4
Onco cachet taken at once, and repeated in 30 minutes, if necessary, but not again for 6 hours.		Syrup	3j
		Aqua ad.	3j

℞ Butyl Chloral	gr. 5	℞ Caffein Salicylate	gr. 1
Tr. Gelsemium	m 10	Phenol Salicylate	gr. 15
Glycerine	3j	Phenacetin	gr. 10
Aqua Menth. Pip. ad.	3j	One powder every 2 hours until the pain is relieved.	

At night, if Caffein causes wakefulness, give :—

℞ Butyl Chloral	gr. 5	℞ Phenacetin	gr. 10
Ext. Cannab. Ind.	gr. ½	Chloralamide	gr. 25
One pill every 3 hours.		In very hot water.	

The following combination of analgesic drugs is often effective :—

℞ Acetanilide	gr. 5	℞ Aspirin	gr. 7
Sod. Salicylate	gr. 10	Pyramidon	gr. 6
Camphor Monobromate	gr. 6	Quin. Salicylate	gr. 1½
For one cachet.		Codeine	gr. ½
		One cachet every 4 hours.	

Gouty Neuralgia

℞ Sod. Salicylate	gr. 5
Phenazone	gr. 5
Syrup Ginger	3j
Aqua Chloroformi ad.	3ss
Every half hour for 3 or 4 doses.	

Trigeminal Neuralgia

℞ Strychnine in large doses hypodermically.
In persistent forms, paint the affected area frequently with Eucalcol and cover with a thin layer of Cotton Wool.

Hysterical Neuralgia of the Face

℞ Ext. Gelsemium	gr. ¼
Quin. Valerianate	gr. 1½
Zinc Valerianate	gr. 1½
Ferri Valerianate	gr. 1½
One cachet t.d.s. after food.	

Neuralgic Headache

℞ Sod. Salicylate with Sod. Bicarb.

Visceral Neuralgia

℞ Tr. Belladonna	m 10
t.d.s.	

NEURALGIA REFERRED OF DENTAL ORIGIN.—See Dental Surgery.

Supra-orbital Neuralgia

℞ Morph. Hydrochlor.	gr. ½	℞ Veratrinæ	gr. 1
Amm. Chlor.	gr. 15	Alcohol	m 6
Quin. Sulph.	gr. 5	Adipis Benzoati	gr. 90
One cachet every 6 hours after food.		A little to be rubbed in every other day.	

Cases with High Blood Pressure should be given Potassium Iodide.

LOCAL APPLICATIONS

Paint		Liniment		Liniment	
R. Ol. Menth. Pip.	ʒiij	R. Lin. Aconite	ʒj	R. Menthol	8 parts
Ol. Camphore	ʒj	Lin. Belladonna	ʒj	Chloroform	4 parts
Lin. Aconiti	ʒiij	Lin. Chloroform	ʒj	Olive Oil	10 parts
Chloroformi	ʒj				

NEURALGIA EPILEPTIFORM. TIC-DOULOUREUX.—

In the milder cases the treatment detailed above should be tried, but in the more severe cases one of the following measures will be necessary:—

Trichlorethylene may claim some specific value, it is administered by inhalation, the patient lying down; care must be taken that the fluid does not touch the face. It is put up in 10 m capsules which are crushed and the contents inhaled three or four times daily.

Injection of 80 to 90 per cent. alcohol directly into the nerve trunk. This cures the pain for periods varying from a few months to five years, when the operation can be repeated. The procedure requires skill and previous experience, as to be successful the needle must actually engage in the nerve trunk, otherwise there is danger of the alcohol spreading and damaging surrounding structures.

The last resort is operation on the Gasserian Ganglion.

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NEURASTHENIA

People in the tropics are more prone to suffer from Neurasthenia as apart from general causes, such as worry, overwork, focal sepsis, sexual neuroses; there are the special conditions of great heat, excessive light, depressing environment, separation from family, isolation, poor food, lack of exercise and alcohol, also debility from malaria, dysentery, enteric and amoebiasis.

As regards treatment one of the most important is prophylaxis by giving a prolonged period of leave after acute infections especially enteric, accidents and operations especially abdominal; the patient thus spends his convalescence entirely free from the worry and responsibility of his work in a good climate with good food of a high vitamin content.

Once the case has developed and the cause, if possible, ascertained and removed, and then improvement does not take place, the only course is to give long leave, and if two years fail to cure and the patient is in one of the services, he will probably have to be invalided out. It has been especially recommended for the tropical form that the patient have hot baths before going to bed and Sodium Glycerophosphate 0.1 gramme hypodermically every day. Or one of the following:—

R Strychnine Arsenatis	gr. $\frac{1}{4}$	R Zinci Phosphid.	gr. 2
Calci Glycerophos.	ʒiss	Ext. Nux Vom.	gr. 2
Syrup Aurantii	ʒij	Ext. Cannabis Ind.	gr. 2
A teaspoonful in a wineglassful of wine after each meal.		Make 24 capsules; one every 8 hours.	
R Ext. Sumbul	gr. 2	R Phospheri	gr. 1/100
Ext. Valerianæ	gr. 1	Ferri Glycerophosph.	gr. 2
Ext. Cimicifugæ	gr. $\frac{1}{2}$	Ext. Cannabis Ind.	gr. $\frac{1}{4}$
One pill twice daily.		One pill twice daily.	
R Bromalin	gr. 10 to 30		
Syrup	ʒj		
Aqua Anisi ad.	ʒj		
Sedative.			

NEURITIS, PERIPHERAL

There is a gradual onset with tingling, pins and needles and cramps; first the sensory then the motor functions are involved, gradually spreading up but not usually above the knees and wrists. It is usually symmetrical, but the cranial nerves and sphincters are never affected. The causes are:—

1. TOXIC.—

A. *Non-metallic*.—Alcohol and Diabetes.

B. *Metallic*.—Arsenic, Lead, Hg, Ag, Cu, and Zn.

2. TOXÆMIA.—Due to specific organisms or their products:—

A. *Primary*.—Leprosy and Septicæmia.

B. *Secondary*.—Diphtheria, Influenza, Typhoid and Syphilis.

3. ENDEMIC.—Malaria and Beri-beri.

4. RHEUMATIC.—After exposure to cold.
5. SENILE AND CACHECTIC.
6. TRAUMATIC.—Occupational and from blows and pressure.

TREATMENT.—The cause must be found and dealt with. Complete rest in bed, with massage and electrical treatment if the case is not too acute. In chronic cases Strychnine should be given hypodermically, and care taken to prevent ankle drop or other deformity from becoming permanent, by a full range of movements several times daily. Pain is the most troublesome symptom, but much can be done by supporting the limbs and protecting them from pressure by cradles. Analgesics may be necessary, such as Phenacetin, Aspirin or Citrate of Caffein or if these fail then Omnopon.

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NEURITIS, OPTIC—See Optic Neuritis.

NEUROSYPHILIS—See Tabes Dorsalis.

NIGHTMARE

Patients who suffer from this condition should sleep on a hard mattress with light bed clothes, but at the same time keeping the feet warm. Late heavy meals and constipation should be avoided.

NIGHT TERRORS

Children who suffer from this condition generally have adenoids, an error of refraction, mucous disease, thread worms or some other source of chronic irritation. They are generally highly strung neurotic children who should be prevented from dwelling

on their terrors and protected from books, stories and sights which might increase their emotions. The digestion should be attended to and a dose of Bromide or Bromide combined with Chloral given at bed-time.

NIPPLE, CRACKS AND FISSURES OF

These generally occur in imperfectly developed or retracted nipples. The importance of the condition is that it may result in acute mastitis or abscess. During the latter months of pregnancy the nipples should be drawn out regularly every day and the epithelium hardened by the application of any weak solution of alcohol. If cracks or fissures form, they should be at once treated with:—

R Acid Carbohc Solution 1 in 20 aa parts.
Glycerine of Tannic Acid.

To be washed off with warm water before the child takes the breast.

NOSE, ACCESSORY SINUSES—*See* article on Disease of the Nose.

NOSE, FOREIGN BODIES IN

These are usually found in children and cause a unilateral purulent foetid discharge, they should be removed with a small blunt hook, never with forceps or by syringing.

NOSE, FRACTURES OF

The parts should be replaced under general anaesthesia by means of the fingers externally, and a pair of blunt forceps inside. The nostrils should then be carefully packed with oiled silk which is changed daily for ten days. Complications are abscess of the septum and progressive deformity probably because the normal growth has been impaired.

NOSE, POLYPUS OF

Polypus of the nose is an oedematous hypertrophy of the mucous membrane, that grows only from the ethmoidal region. It is frequently associated with suppuration in the sinuses.

Treatment depends upon whether there are a few polypi or several growths complicated by active bone disease. In the former case a few drops of a 10 per cent. solution of Cocaine and Adrenalin is packed around the growths and in half an hour there will be sufficient anaesthesia to remove the polypi with a wire snare. The loop should be manœuvred high around the pedicle or removal may be made by avulsion; the latter is somewhat painful but gives better results. If there are several

growths accompanied by active bone disease the operation of chipping away the diseased bone and opening up the ethmoidal cells will have to be performed by a nasal specialist.

OBESITY

In its simplest form is due to a disproportion between the intake of energy in the form of food and output in muscular exercise. There is a tendency to put on weight at the following periods: at puberty, in men after middle age, during pregnancy and at the menopause. In some cases it is hereditary and at times associated with anæmia, chronic pulmonary disease, myocardial degeneration and the metabolic disorders of gout and diabetes. Changes in endocrine secretion, not only of the testes and ovaries, but also of the thyroid and posterior lobe of the pituitary, are a cause in some cases.

TREATMENT.—Before commencing any form of treatment it is important that a complete clinical and biochemical examination should be made to discover any underlying condition. Treatment may be considered under the heads of dietetic, physical and medicinal.

DIETETIC.—The carbohydrates and fat contribute most to the formation of adipose tissue, and it is the consumption of these which must be restricted. Various schemes such as Banting's, Oertel's and Von Noorden's have been devised, which differ chiefly in the extent to which each of the constituents is reduced. Starvation may be carried out one day a week or three complete days in the month. For details of these diets books on General Medicine should be consulted.

PHYSICAL.—Is best carried out by exercise in the form of gentle hill climbing if the patient's heart will stand it, but always short of breathlessness. Massage, electrical treatment and Turkish baths will help.

MEDICINAL.—Of all the numerous drugs recommended Thyroid and Fucus Vesiculosus are the most reliable. The following prescriptions can be recommended:—

R Liq. Ext. Fuci Vesiculosi	3j	R Thyroid 5 gr. dried gland, twice
Sodium Iodide	gr. ʒ	daily.
Liq. Thyroides	m 5	
Aqua Chloroformi ad.	ʒj	
t.d.s.		

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ŒDEMA OF THE LUNG—*See* Cardiac Disease.

This may also come on suddenly in High Blood Pressure, Nephritis and after tapping the pleura. It should be treated by the immediate injection of Atropine up to 1/60 gr. Venesection is also very effective.

OLD AGE

The phenomena of old age are due to a gradual diminution in the activity of the endocrine glands—not one gland in particular, but the whole ductless glandular system. Reaction is diminished and pain is not felt so acutely; there may be considerable fever without any rise of the thermometer in the mouth, and constipation is very frequent.

The aged require little food: they are usually grossly overfed; their diet should consist of vitamin containing foods, as butter, milk, cream, and eggs, with tomatoes, spinach and fresh fruit, abundance of fresh air, with physical and mental exercise.

OPHTHALMIA, SYMPATHETIC

PREVENTIVE TREATMENT.—The immediate removal of the eye in all penetrating wounds:—

- (1) Which involve the iris, ciliary body, lens, capsule or choroid.
- (2) Chronic iridocyclitis resulting from injury.
- (3) The sight is irretrievably lost.

EXCEPTIONS.—(1) If acute sympathetic ophthalmia has already developed and the exciting eye has moderate vision, the latter may ultimately give the better vision.

(2) If the eye has suppurated, eyes that have suppurated practically never cause sympathetic ophthalmia.

CURATIVE TREATMENT.—This is unsatisfactory, the majority of cases ending in total blindness.

LOCAL.—Protection from light, leeches to the temples, hot fomentations, and full dilatation of the pupil with Atropine.

GENERAL.—Brisk purge of Calomel, followed by free daily opening of the bowels. Salvarsan has given the best results, an injection at the outset and another subsequently. Otherwise Mercury must be pushed.

ORAL SEPSIS—*See* Dental Surgery.

ORCHITIS

The cause should be discovered and treated; the most frequent is injury. The patient is kept in bed, on a light diet, and bowels freely opened with salines, and the scrotum kept up on a small pillow, and either the following ointment or lotion applied.—

<i>R</i> Guaiacol	<i>ʒi</i>	<i>R</i> Amm. Chloride	<i>ʒi</i>
Cocaine	gr. ʒ	Spt. Rect.	<i>ʒi</i>
Paraff. Moll. ad.	<i>ʒiiss</i>	Aqua Dest. ad.	<i>ʒvi</i>
To be smeared over the testicles and covered loosely with lint.		The lint covering the testicles to be kept well soaked.	

If an abscess forms, it should be opened at once: this condition is frequently followed by hernia testis; this heals in time, but usually a large part of the testicular substance has been protruded and destroyed.

ORIENTAL SORE

This is an unsatisfactory condition to treat. Potassium or Sodium Antimony Tartrate should be given in the same way as for Kala-azar, but it is not always successful. Neostibosan has also been used with good results. Locally Carbon Dioxide snow applied for ten to thirty seconds is said to be the best treatment. Tartar Emetic ointment is not recommended being usually very painful and may cause sloughing.

OSTEO-ARTHRITIS

This condition is probably due to degenerative changes from deficient supply of lymph and blood to the joints. It frequently follows trauma with a definite history dating from an accident, and is commonly associated with metabolic endocrine disturbance and arterio-sclerosis.

TREATMENT.—Attention should be paid to the general health in accordance as to whether the patient is obese or badly nourished. The circulation through the joints should be improved by either radiant heat, diathermy, ionization with Iodine or massage. Search must be made for any possible septic focus. The joints should be relieved of undue pressure and strain but

this does not exclude exercise which is beneficial to the general health and in moderation to the joints.

Relief of pain is carried out by hot sand-bags or painting with paraffin wax at a temperature of 180° to 160° F. Hot fomentations of lead and opium or turpentine followed by the application of linaments, such as equal parts of Lin. Aconite, Belladonna and Chloroform. Or hot douches of salt and water especially at night followed by the application of Menthol and Methyl Salicylate.

Internally the following are useful:—

℞ Syrup Ferrous Iodide	3ss	or ℞ Potassium Iodide	gr. 6
Arsenious Iodide	gr. 1/30	Sod. Salicylate	gr. 10
Syrup Lemon	3j	Pot. Bicarb.	gr. 15
Aquam ad.	3j	Syrup Amantii	m 20
	t.d.s.p.c.	Aqua Chloroformi ad.	3j
			t.d.s.p.c.

℞ Guaiacol Carb. gr. 8. In cachet t.d.s.

Surgical interference may be required in some cases for excessive bony outgrowth or ankylosis in a faulty position, but these are severe operations.

OSTEO-MYELITIS—*See* Bone Inflammation.

OTITIS MEDIA, ACUTE—*See* Diseases of the Ear.

OTITIS MEDIA, CHRONIC—*See* Diseases of the Ear.

OTOSCLEROSIS—*See* Diseases of the Ear.

OVARITIS—*See* Salpingo-oophoritis.

OXALURIA

The causes of an increase of Calcium Oxalate in the urine are not known. As regards diet, measures should be taken to exclude excess of both calcium and oxalic acid by forbidding milk, rhubarb, eggs, tea, figs, beetroot, spinach and tomatoes; and giving fish, meat, rice, bread and other farinaceous foods. ℞ Mag. Sulph. gr. 80 daily is advisable as the magnesium salt is more soluble than the calcium. Exercise and a digestive mixture with Nitro-Hydrochloric Acid is also useful.

OZÆNA—*See* Rhinitis under Diseases of the Nose.

PALMAR ABSCESS—*See* Abscess.

PALPITATION—*See Cardiac Disease.*

PANNUS—*See Diseases of the Eye.*

PARALYSIS AGITANS

These unfortunate patients should be encouraged to continue their normal work and pleasures as long as possible; the disease cannot be cured and is slowly progressive; drugs have little influence over the tremors, but those of the Hyoscine, Belladonna, Stramonium group relieve the rigidity thus giving more freedom, and diminish the excessive salivation. R Hyoscine Hydrobromide commencing at 1/100 gr. t.d.s. and gradually increasing up to 1/75 gr. or even 1/50 gr. or R Tr. Belladonna from 15 to 40 m t.d.s. or R Genoscopolamine 1/80 to 1/15 gr. daily. But in all cases a watch must be kept for the appearance of any toxic symptoms, the first being difficulty in reading from loss of accommodation for near vision and then dilatation of the pupils.

PARAPHIMOSIS

This must be immediately reduced, the penis being firmly bandaged from before backwards with a cold water bandage for 10 minutes. It is then removed and by a combination of steadily pulling with the index and middle fingers of both hands on the side of the penis, the thumbs at the same time pressing backwards on the glans, reduction is effected. If reduction is still impossible, the constricting bands must be divided. After the oedema has gone, circumcision should be advised.

PARATYPHOID

Treatment the same as for Enteric. *See Enteric.*

PARKINSONISM—*See Paralysis Agitans.*

PARONYCHIA—*See Whitlow.*

PAROTITIS—*See Mumps—Also Diseases of the Salivary Glands.*

PAROXYSMAL TACHYCARDIA—*See Cardiac Disease.*

PEDICULOSIS CAPITIS

The adjacent skin is smeared with Zinc ointment to protect it, then smear the scalp well with common Paraffin oil and

cover with rags soaked in the oil, and apply over all an oiled silk bathing cap. A second application is made after 12 hours and after another 12 hours the scalp is thoroughly washed with soap and hot water, but on no account must the scalp be washed before the application of the oil, as this would make the application of the oil very painful. The nits must now be removed with a tooth comb after first dissolving the cement which binds the nits to the hair by a lotion of Acetic Acid (1 in 4). If the oil is objected to Ammoniated Mercury ointment 2 per cent. may be used.

PEDICULOSIS CORPORIS

The parasite is chiefly found in the under-linen in which the eggs are also deposited, but eggs are also found on the hairs of the body. Disinfect the clothes by heat, and apply to the body:—

R Ung. Sulphuris B.P. and Vaseline equal parts.

PEDICULOSIS PUBIS

The parasite is rapidly destroyed by antiseptics. Shave off the hair and apply:—

R Hydrarg. Amm.	...	...	gr. 10
Liq. Picis Carb.	...	...	3j
Ung. Paraffini ad.	...	...	3j

PELLAGRA

The three chief features of this disease are: (1) Gastro-intestinal symptoms; (2) Skin lesions; (3) Nervous symptoms. The patient should be treated in healthy cool surroundings with plenty of fresh air but protected from strong sunlight. The essential treatment is dietetic; the diet should be rich in vitamins and protein with liver, eggs, underdone meat, and plenty of fresh fruit and vegetables. It is important to exclude maize in every form.

PEMPHIGUS

This is a very serious disease. P. Vegetans and P. Foliaceus are always fatal, even in P. Vulgaris 85 per cent. of the cases die. Little can be done in the way of treatment beyond applying mild antiseptics to prevent septic complications and giving Arsenic and Cod Liver Oil internally. Good results have recently been reported from blood transfusion and Protein Shock might be tried early in the disease, the first dose not being more than 5 M typhoid organisms.

PERICARDITIS

The underlying pathological condition must be sought for and treated, *i.e.* Rheumatic infection with salicylates, Pyæmic and Septicæmic conditions with specific antisera and autogenous vaccines. In the second place measures must be taken to alleviate the symptoms, limit the inflammation and, if possible, avert permanent myocardial dilatation and insufficiency. Absolute rest in bed is imperative; counter-irritation over the pericardium or leeches, the latter being particularly effective. Pain may be relieved by an ice-bag on a thin layer of muslin, or hot fomentations; for the distressing cough a linctus containing Codeine or in children Tr. Camph. Co. Vomiting, which is often an initial symptom in children, is a grave sign later, and should be met by stopping all food and giving rectal salines. For the mental distress, anxiety and insomnia, give small doses of Dover's powder.

PERIOSTITIS—*See* Bone, Inflammation of.

PERIPHERAL NEURITIS—*See* Neuritis, Peripheral.

PERITONITIS, TUBERCULOUS

By this is meant an infection of the peritoneum extending to the intestines and mesenteric glands. Four types have been described: (1) Glandular, (2) Ascitic, (3) Adhesive and (4) Ulcero-casuous.

The general treatment of these cases is that for tuberculosis generally, complete rest lying down during the acute febrile stage, fresh air, sunshine, a liberal diet of high vitamin content. The ascitic type frequently clears up after laparotomy, but slow paracentesis is preferable. Drugs may be required for checking diarrhoea and fermentation and relieving pain. Dover's powder is the best analgesic.

Locally: Equal parts of Iodoform and Olive Oil, or Ung. Hydrarg., or Lin. Hydrarg., half a drachm of either of these should be rubbed into the abdomen night and morning and covered with a firm binder. One of the following should be given internally t.d.s.:—

℞ Liquid Paraffin	3ss	or ℞ Iodoform	gr. $\frac{1}{2}$
Creosote	m $\frac{1}{4}$	Tr. Lavandulæ Co.	m 7
Oleum Amygdalæ	m $\frac{1}{4}$	Emulsi Olei Morrhue ad.	3i
Glucidi	gr. 1/16		
Mucilage	q.s.		
Aqua Menth. Pip. ad.	3i		
A teaspoonful for a child of one year.			

PERITONSILLAR ABSCESS—*See* Diseases of the Throat.

PERNICIOUS ANÆMIA—*See* Anæmia.

PERSPIRATION, EXCESSIVE AND OFFENSIVE

The application of X-rays is very effective in all forms of excessive sweating, and gives permanent results. If for the feet alone, a 2 per cent. solution of Chromic Acid applied on a tampon of cotton wool is effective.

PERTUSSIS—*See* Whooping Cough.

PHARYNGITIS—*See* Diseases of the Throat.

PHIMOSIS—*See* Circumcision.

PHLEBITIS

May be suppurative or non-suppurative; deep-seated suppurative phlebitis is always fatal. If the infected vein is accessible, ligature the vessel above and below and remove the thrombus. Treatment of the non-suppurative form is immediate and complete rest of the affected part, and the patient; this is the only way of avoiding the principal complication, embolism, which may cause sudden death. A period of rest for several weeks may be necessary until the clot either becomes organized or resolution takes place. Pain may be relieved by the application of Glycerine and Belladonna. The following mixture should be given:—

R Potassium Citrate	...	...	gr. 15
Sp. Ann. Aromat.	...	...	℥ 15
Amm. Carb.	...	...	gr. 4
Glycerine	...	...	℥ 20
Aqua Ment. Pip. sd.	...	...	℥ss
Every 4 hours.			

Milk must be excluded from the diet on account of the large proportion of lime salts.

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PHOTOTHERAPY—See Special Article.

PHTHISIS—See Pulmonary Tuberculosis.

PHTHISIS, LARYNGEAL—See Diseases of the Throat.

PILES—See Hemorrhoids.

PINK DISEASE

This is probably a nutritional disorder, most cases are in children of two to three years. The hands and feet are cold, swollen and bright pink, hence the name. The other characteristic of the disease is that the child is in a state of profound misery. There is no specific treatment, recently it has been claimed that artificial light is very effective.

PLAGUE

At the outset, the bowels should be opened with Calomel and a Saline. The most important point is to keep the patient at absolute rest in bed, as the majority of cases are fatal from syncope; good and careful nursing is essential, and there should be abundance of fresh air. The patient should be encouraged to drink freely of barley or plain water, in order to wash out the toxins and maintain the action of the kidneys. The diet should be light and stimulating. No drug is specific. Strophanthus, Strychnine, Digitalis and Alcohol should be given early and freely, to support the heart; personally, I have obtained the best results with Strophanthus. Tincture Iodine has been given intravenously, and large doses of Carbolic Acid and Hydrarg. Perchlor. and good results have been reported.

SERUM TREATMENT.—This sometimes gives good results in Bubonic, but is useless in Pneumonic and Septicæmic cases. If available, may be tried at the very beginning, in doses of 100 c.c., intravenously or subcutaneously. See also Specific Therapy.

SURGICAL TREATMENT.—Buboes should not be excised, for fear of a general infection; abscesses should be treated with antiseptic fomentations, and only opened when pus has formed.

Pneumonic and Septicæmic forms are almost invariably fatal, and little can be done beyond the usual treatment for Pneumonia q.v. and stimulants for the heart.

PROPHYLAXIS.—This is summed up in avoidance of contact between man and the rat, and the use of Haffkine's Vaccine for those exposed to infection. See Specific Therapy.

PLANTAR ABSCESS.—See Abscess.

PLEURISY

The varieties are:—

1. **ACUTE DRY PLEURISY.**—Which may be Acute or Chronic.
2. **PLEURISY WITH EFFUSION.**—Which may be Simple or Purulent.

TREATMENT.—**ACUTE DRY PLEURISY.**—First consider the possible source of the infection; in every case of pleurisy the possibility of tubercle should be kept constantly in the foreground. The pain may be relieved by leeching, dry or wet cupping, strapping the chest or by the application of antiphlogistine or poultices. After a dose of Calomel followed by a Saline, give:—

R Liq. Ext. Opii	m 10	or R Amm. Chloride	gr. 10
Saheini	gr. 10	Vinum Antimonial	m 6
Pot. Cit.	gr. 20	Liq. Ext. Liquorice	3ss
Liq. Amm. Acet.	ʒij	Aqua Anisi ad.	3ss
Aquam ad.	ʒj		

Every four hours.

Every three hours until pain is relieved.

R Sod. Salicylate	gr. 15	R Menthol	gr. 10
Pot. Iodide	gr. 8	Cocaine Hydrochlor.	gr. 5
Liq. Amm. Acet.	ʒij	Adipis Lano	ʒj
Inf. Gentian Co. ad.	ʒj		

Application for pain to be well rubbed in.

At first every four hours, later
t.d.s.

The pain may be so intense especially in diaphragmatic pleurisy that only an injection of Morphia will relieve it. The persistent cough should be treated with a linctus containing Codeine or Heroin.

PLEURISY WITH EFFUSION.—For small or moderate effusions treat as for acute dry pleurisy; after the temperature is normal counter-irritation will bring about absorption in most cases; if not, an exploratory puncture should be made and a small quantity of fluid withdrawn and this will usually bring about absorption; but in a small percentage the effusion will increase with or without fever.

Note.—Whenever possible paracentesis should be performed when the patient is free of fever, as if there is pyrexia; the effusion will often recur.

In the case of large effusions if at the end of three weeks there is no evidence of diminution, paracentesis should be performed. It is never justifiable to leave a large effusion as the lung collapses followed by fibrotic changes and bronchiectasis, sinking in and deformity of the chest and a compensating scoliosis of the spine. Paracentesis must be immediately performed if at any time there is embarrassed circulation as shown by a quick and irregular pulse or palpitation, or respiratory distresses with dyspnoea, lividity and frothy blood-stained sputum. As to how paracentesis should be performed see Minor Operations.

The following diuretics may aid in the absorption of fluid:—

R Pot. Iodide	gr. 5	R Liq. Ext. Opii	m 5
Pot. Cit.	gr. 20	Acid Sulph. Aromat.	m 10
Inf. Digitalis (recent)	ʒij	Tr. Senega	ʒss
Aqua Chloroformi ad.	ʒss	Inf. Cascariillæ ad.	ʒss
Every four hours.		For distressing irritable cough.	

Opium should not be given if there is any lividity.

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PLUMBISM

The toxic manifestations of lead are colic, palsy, anæmia and rarely meningo-encephalopathy. When acute symptoms are present it is very important not to attempt the elimination of the lead, but to favour its storage in the bones by giving large quantities of Calcium in the form of milk, 4 pints daily, and Calcium Lactate 12 gr. t.d.s. After all acute symptoms have subsided the elimination of the lead from the body should be commenced, the diet is reversed, all articles containing Calcium, such as milk, cheese, butter, eggs and green vegetables, being excluded, and liver, meat, rice, tomato, potato and banana being given instead. At the same time a mild Acidosis is produced by giving Amm. Chloride 15 gr. in a small tumbler of water eight

times daily. Potassium Iodide was formerly used in doses of 5 gr. increasing up to 15 gr. t.d.s., but is not so effective as the Acidosis. After a month give a rest to the treatment for a week and then recommence, the bowels being regulated throughout the treatment. Should any toxic symptoms appear during the treatment, the Acidosis treatment must be stopped and that favourable for the storage of lead instituted. See also Lead Poisoning—Recent Advances in Medicine.

PNEUMONIA, LOBAR

At the two extremes of life the condition is usually a broncho-pneumonia, while in the adult it is usually lobar. The treatment may be either expectant which is based on supporting the patient's strength and treating distressing symptoms, while the disease takes its short definite course. The other is specific, such treatment including the use of anti-pneumococcal sera, vaccines and drugs having direct bactericidal powers.

EXPECTANT TREATMENT.—The chief object is to give absolute rest and good sleep, disturbing the patient as little as possible. There should be an initial dose of Calomel followed by a Saline and the bowels subsequently kept opened daily. The diet should be easily digested and light, with plenty of water, barley water, orangeade or imperial drink. The clothing should be light and warm; plenty of fresh air, but out-of-door treatment is not recommended.

PAIN.—Should be treated with antiphlogistine or hot fomentations, but ice-bags or compresses should not be used in the very young or old. Leeches may be useful, but the intense pain may require Omnopon $\frac{1}{4}$ gr. or Morphia $\frac{1}{4}$ gr.

COUGH.—Cough will probably require Morphia in some form. Heroin or Codeine is useful.

SLEEPLESSNESS.—During the first 48 hours is best treated with Dover's powder 10 gr.; later by Medinal; or a combination of Aspirin with Medinal or Paraldehyde.

GENERAL MEDICINAL TREATMENT.—Has no influence on the course of the disease, but the first of the two following mixtures aids the elimination of toxin and the second will loosen the secretion:—

R Pot. Citrat.	gr. 15	or R Pot. Citrat.	gr. 15
Sp. Ætheris Co.	3j	Taq. Ann. Acet.	3ij
Aquam ad.	3j	Spl. Ætheris Nit.	m 40
		Tr. Camph. Co.	m 15
		Syrup Tolu.	3ss
		Aqua Chloroformi ad.	3j
		Every four hours.	

STIMULANTS.—A person accustomed to take alcohol should be given the amount he is used to in the form of the best whisky. If signs of acute Heart failure appear, give Strychnine 1/60 gr. every four hours or combine it with Digitalis. Strophanthin and Pituitrin are also efficient.

OXYGEN.—Alone or combined with 5% CO₂ should be given early before the appearance of marked cyanosis. See the Administration of Oxygen.

SPECIFIC TREATMENT.—Anti-pneumococcus Serum. See Specific Therapy. Vaccines have also been advocated; a stock mixed vaccine of all four types of pneumococci should be given early and repeated daily in doses of 20 to 200 M and in some case rapid abortion of the disease follows.

CHEMICAL AGENTS.—Optochin in 3 to 4 gr. doses, but not exceeding 16 to 18 gr. daily, and never for more than 3 days, it is sometimes useful but not free from danger; S.U.P. 36 gives dramatic results in some cases, and is useless in others; Quinine, Gentian Violet and Sodium Nucleinate have also been given.

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POISONING

Is the most urgent of all emergencies and calls for immediate action and treatment even before a definite diagnosis is made, and it must be borne in mind that the case is either suicidal, homicidal or accidental and therefore may have important medico-legal bearings.

1. The stomach must be emptied by either an emetic or stomach tube, except in the case of corrosives. To determine this point, there will generally be marks on the lips and upper surface of the tongue, or the breath will smell; if not moisten your finger, touch the patient's lips and then taste your finger.

2. If a stomach tube is available, wash out the stomach 6 to 8 times with half a pint of warm water each time syphoning out in the usual way until the washings are clear. Keep the washings, vomit and urine for analysis.

3. If the stomach tube is not available, give an emetic. The following can be obtained in any house:—

- (a) Salt or Mustard—a tablespoonful in half a pint of warm water.
- (b) Three large cupfuls of tepid dish water.
- (c) Then if the patient does not vomit, tickle the back of the throat with the finger.
- (d) If you have emetics with you, give one from the following list:—
 - (1) Pulv. Ipecac.—30 gr. in water.
 - (2) Zinc Sulphate—30 gr. in 8 oz. water.
 - (3) Copper Sulphate—5 gr. in half-pint of tepid water.
 - (4) Vinum Ipecac.—1 oz. in half-pint of tepid water.

But if the patient is comatose, give Apomorphine Hydrochlor. 1/10 to $\frac{1}{8}$ gr. hypodermically.

4. While carrying out this treatment, make your diagnosis as to the particular poison, from the smell, appearance and taste of the remains in the receptacle from which the poison was swallowed and from the following symptoms. See Diagnosis below.

5. In these cases the friends and relations of the patient are naturally anxious, and it is better to distract their attention by giving them something to do; and incidentally preparing for the next stage of the treatment. With this in view, instruct one person to beat up an egg in half a pint of cold milk, another to boil a small kettle of water with a handful of tea in it, and a third to prepare hot bottles and blankets.

DIAGNOSIS.—For diagnosis of the particular kind of poisoning, the following list is taken from Murrell's 'What to Do in Cases of Poisoning':—

(1) YOU WILL FIND THE PATIENT DEAD—

Prussic Acid.	Carbon Monoxide.
Potassium Cyanide.	Oxalic Acid.
Strong Ammonia.	Other active poisons given in
Carbonic Acid Gas.	large doses.

(2) PATIENT IS COMATOSE—

Opium.	Chloral.
Morphia.	Chloroform.
Alcohol.	Camphor.
Carbolic Acid.	

(3) IS COLLAPSED—

Strong Acids.	Tobacco.
Alkalis.	Antipyrin.
Aconite.	Antifebrin.
Antimony.	Last stage of most poisons.
Arsenic.	

(4) IS CYANOZED—

Aniline.	Antifebrin.
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(5) IS DELIRIOUS—

Cannabis Indica.	Hyoscyamus.
Belladonna } Noisy.	Alcohol.
Datura }	Camphor.

(6) IS TETANIZED—

Nux Vomica.	Antimony.
Strychnine.	Excessive pain also approaches
Arsenic.	this condition.

(7) IS PARALYZED—

Aconite.	Lead.
Arsenic.	Conium.

(8) PUPILS DILATED—

Datura.	Chloroform.
Belladonna.	Alcohol.
Hyoscyamus (in the	Opium }
early stage).	Aconite } the Last Stage.

(9) PUPILS CONTRACTED—

Opium.	Physostigmine.
Chloral.	Carbolic Acid.

(10) SKIN IS DRY—

Datura.	Belladonna.
Hyoscyamus.	

(11) SKIN IS MOIST—

Opium.	Tobacco.
Aconite.	Other poisons in the stage of
Antimony.	collapse.
Alcohol.	

(12) MOUTH IS BLEACHED—

Carbolic Acid.
Corrosive Sublimato.

Caustic Acids and Alkalies

(13) IS VOMITING—

Arsenic (brown with blood).	Aconite.
Antimony (white).	Ammonia.
Digitalis (green).	Phosphorus, etc.

GENERAL TREATMENT.—1. After lavage leave the tube *in situ*; it is a convenient means of introducing further treatment. Now give the egg and milk, followed by the strong tea cooled down by cold water. The immediate urgency is now over; and

2. By this time you will have been able to obtain the Chemical or Physiological (if one be known) Antidotes which then proceed to administer.

3. HASTEN ELIMINATION of the poison by—

- (a) Intravenous infusion of normal saline solution in poisoning with alkaloids.
- (b) Aperients.

4. TREAT SPECIAL SYMPTOMS.—

- (1) COLLAPSE.—Hot bottles, hot blankets. Strong coffee by mouth or rectum. Elevate foot of bed. Collapse due to pain is best treated by a Morphia injection.
- (2) SYNCOPÉ.—Recumbency; Ether or Strychnine hypodermically; Sp. Ann. Aromat. by the mouth; Faradism; Mustard loaf to pericardial region.
- (3) RESPIRATORY FAILURE.—Artificial respiration, Cold affusion, Tracheotomy if there is laryngeal obstruction; Oxygen inhalation.
- (4) PAIN.—Morphia, hypodermically, if severe.
- (5) When poison has been eliminated as far as possible, GIVE DEMULCENTS.

Note.—Retention of urine as well as suppression may occur in cases of poisoning.

TREATMENT APPLICABLE TO EACH PARTICULAR POISON.—

<i>Poisons</i>	<i>Treatment</i>
ACIDS, MINERAL— Sulphuric. Hydrochloric. Nitric. Acetic. Battery fluids. Soldering fluids.	<i>Caution.</i> —Lavage and emetics not admissible. Chemical Antidotes Nos. 1, 2, 3 and 4. Demulcents Nos. 1, 3 and 4. Do not use Carbonates to neutralize Acids, if Magnesia can be obtained.
ACID CARBOLIC— Creosote. Disinfecting fluids.	Lavage with care. Wash out with Magnesium or Sodium Sulphate $\frac{1}{2}$ oz., in 8 oz. of water. Do not rely on emetics. Demulcents Nos. 1 and 2. Stimulants—Freely. Saline—Intravenous or per rectum.
ACID HYDROCYANIC (Prussic Acid)— Oil Bitter Almonds. Cyanides.	General treatment. Particularly for respiratory failure. Stimulants Nos. 1, 4, 5 and 9.
ACID OXALIC— Salt of Lemon. Salt of Sorrel.	<i>Caution.</i> —Lavage and emetics, only if case is treated soon after ingestion of poison, and then cautiously. Chemical Antidotes Nos. 1 and 4, <i>not</i> 2 or 3. Do not give Sodium or Potassium Carbonates; the resulting compound are soluble and poisonous.
ACONITE.	General treatment. Especially for respiratory failure. Stimulants Nos. 1 and 6. Saline infusion.
ALCOHOL.	General treatment. Especially cold affusion, faradism and artificial respiration.

<i>Poisons</i>	<i>Treatment</i>
ALKALIES—	<i>Caution.</i> —Lavage and emetics not admissible.
Potash.	Chemical Antidotes Nos. 5 and 6.
Soda.	Demulcents Nos. 1, 2 and 3.
Ammonia.	Stimulants.
Weed-killer.	Artificial respiration.
ANILINE.	Bleeding.
	Intravenous Saline.
ANTIMONY SALTS—	General treatment.
Tartar Emetic.	Especially stimulants and treatment for collapse.
Butter of Antimony.	Vomiting generally occurs from the action of the poison; give copious draughts of warm water.
	Chemical Antidote No. 12.
	Demulcents Nos. 1 and 4.
ARSENIC COMPOUNDS—	General treatment.
White Arsenic.	Chemical Antidote No. 8.
Weed-killers.	Demulcents.
Sheep Dips.	
Some vermin-killers.	
Some fly-papers.	
BARBITURATE POISONING.—	See Recent Advances in Medicine.
BARIUM SALTS.	General treatment.
	Chemical Antidote No. 7.
BELLADONNA—	General treatment.
Datura.	Especially for respiratory failure.
Stramonium.	Chemical Antidote No. 12.
Hyoscyamus.	Physiological Antidote No. 7.
CALABAR BEAN	Lavage or emetic.
	Chemical Antidote No. 12.
	Physiological Antidote Nos. 2 and 3.
	Stimulant No. 6.
	Artificial respiration.
CAMPHOR—	General treatment.
Lin. Camph.	

<i>Poisons</i>	<i>Treatment</i>
CANTHARIDES.	General treatment. Be careful if mouth or œsophagus is blistered. Demulcents.
CHLOROFORM.	General treatment. Especially fresh air, stimulation and artificial respiration. Physiological Antidote No 1.
COCAINE.	General treatment. Stimulants Nos. 4, 6 and 9. Physiological Antidote No. 1.
COPPER SALTS.— Blue Vitriol, Verdigris.	General treatment. Chemical Antidote No. 2 or Pot. Ferrocyanide 10 gr., in 2 oz. of water. Demulcent No. 1; copiously.
DIGITALIS.	General treatment. Chemical Antidote No. 12.
ERGOT.	Lavage or emetic. Chemical Antidote No. 12. Friction. Recumbent position. Stimulants.
FUNGI.	Lavage or emetic. Physiological Antidote No. 2. Stimulants. Purgatives.
GASES— Carbon Monoxide, Carbon Dioxide, Grain pit gas, Sewer gas, Coal gas, Acetylene, Chlorine, Nitrous fumes.	General treatment. Especially artificial respiration and oxygen inhalation. Blood transfusion for treatment of carbon monoxide poison.
HEMLOCK.	Lavage or emetics. Chemical Antidote No. 12. Stimulants. Friction.

<i>Poisons</i>	<i>Treatment</i>
HYPNOTICS— Chloral Hydrate. Chloramido. Sulphonal. Paraldehyde.	General treatment. Stimulants, especially No. 6. Do not rely on emetics.
INDIAN HEMP (Cannabis Indica).	Lavage, emetics, purgatives. Stimulants. Chemical Antidotes Nos. 5 and 6.
IODINE.	General treatment. Chemical Antidote No. 4. Demulcents, copiously.
LEAD SALTS.	General treatment. Chemical Antidote No. 7.
LOBELIA.	Lavage, emetics. Chemical Antidote No. 12. Stimulants. Friction.
MERCURY SALTS.	General treatment. Demulcents Nos. 1 and 4, very freely.
MINERAL OILS— Benzoline. Paraffin. Petroleum.	General treatment. Demulcent No. 2, freely, fol- lowed by free lavage with milk.
OLEANDER.	General treatment. Chemical Antidote No. 12. Injections of Ether and Mor- phia.
OPIUM— Morphia. Codeine. Chlorodyne. Laudanum. Paregoric. Syrup of Poppy. Teething Powders. Soothing Syrups.	<i>Caution.</i> —Do not overdo forced movements, rousing and exposure. General treatment. Do not rely on emetics. Chemical Antidote No. 11, freely washing out after each dose. Physiological Antidote No. 2. Stimulants, freely. Permanganates are not alto- gether harmless remedies.

<i>Poisons</i>	<i>Treatment</i>
PHOSPHORUS.	General treatment. Chemical Antidotes Nos. 9 and 10. Demulcents, carefully avoiding oil.
PUTRID FOOD— Tinned food.	General treatment. Especially for collapse. Chemical Antidote No. 12.
RAT PASTES.	See ARSENIC and PHOSPHORUS.
SILVER SALTS.	General treatment. Chemical Antidote: Common Salt $\frac{1}{2}$ oz., in a pint of water. Demulcents Nos. 1 and 4.
STRYCHNINE.	General treatment. Place patient under Chloroform, then give Emetic No. 1, or lavage. Chemical Antidote No. 12. Physiological Antidote No. 3 or 8.
TURPENTINE— Polishing fluids. Polishing pastes.	General treatment. Lavage with milk.
VEGETABLE IRRITANTS— Unidentified Plants. Violent Purgatives. Savin. Squill. Nicotine. Tobacco.	General treatment. Demulcent No. 1. Milk, freely by stomach tube.
ZINC SALTS— White Vitriol. Burnett's Fluid. Soldering Fluid.	Caution.—Lavage and emetics are not admissible, except in poisoning with neutral salts. Chemical Antidote No. 2. Demulcent No. 1. Milk, copiously.

PHYSIOLOGICAL ANTIDOTES.—

1. Amyl Nitrite Capsules—3 m, for inhalation.
2. Atropine Sulphate—1/60 gr., hypodermically.
3. Chloral Hydrate—40 gr. in 3 oz. of water, by rectum or mouth.
4. Chloroform—for inhalation.
5. Tr. Digitalis—20 m, hypodermically.
6. Morphine Tartrate— $\frac{1}{3}$ gr., hypodermically.
7. Pilocarpine Nitrate— $\frac{1}{4}$ gr., hypodermically.
8. Potassium Bromide—30 to 60 gr. in water, by the mouth.

NORMAL SALINE SOLUTION.—Common Salt, 60 gr., in one pint of sterilized water 98.4° F.

CHEMICAL ANTIDOTES.—

1. Chalk, Whiting, or Wall Plaster— $\frac{1}{2}$ oz. stirred up in water.
2. Sodium or Potassium Bicarbonate—120 gr. in water; only used for acids in the absence of magnesia and chalk, on account of the rapid evolution of gas.
3. Magnesia— $\frac{1}{2}$ oz. stirred up in water.
4. Sacch. Sol. of Lime—1 to 2 fl. dr. in water.
5. Citric or Tartaric Acid—20 gr. in water.
6. Vinegar or Lime-juice—1 oz., diluted with water.
7. Magnesium or Sodium Sulphate— $\frac{1}{2}$ oz. in 8 oz. of water.
8. Hydrated Ferric Oxide—produced by adding to $\frac{1}{2}$ oz. Sol. of Ferric Chloride in 8 oz. of water, either $\frac{1}{2}$ oz. Magnesia, or 2 fl. dr. Sol. of Ammonia.
9. Copper Sulphate—2 $\frac{1}{2}$ gr., in 2 or 3 oz. of water.
10. French Turpentine or Sanitas—30 m, in 1 oz. of water, repeated about four times in the first hour.
11. Potassium Permanganate—5 gr., in half-pint of water.
12. Tannic Acid—30 gr., in water or strong tea.

DILUENTS.—

1. Milk.
2. Olive Oil.

3. Thick Gruel—Fine Oatmeal 1 oz., mixed and boiled with 10 oz. of water.
4. White of Egg.

STIMULANTS.—

1. Brandy or whisky—1 to 2 oz. with 4 oz. of warm water by the mouth; $\frac{1}{2}$ to 1 oz. with 2 oz. of warm water by rectum; 1 to 2 dr., hypodermically.
2. Champagne.
3. Mist. Ammoniac et Aetheris—1 to 2 oz. by mouth.
4. Spt. Amm. Aromat.—2 dr. in 2 oz. of water.
5. Ether—30 to 60 m, hypodermically.
6. Strychnine Hydrochlor.—1/60 gr., hypodermically.
7. Coffee—2 oz., to be boiled with $\frac{1}{2}$ pint of water.
8. Mustard Loaf.
9. Smelling Bottle.

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POLYPUS, NASAL—See Nose, Polypus of.

POLYPUS, RECTAL—See Rectum, Diseases of.

POST-NASAL GROWTHS—See Adenoids.

POTT'S DISEASE—See Spine, Caries of.

PREGNANCY, DISORDERS OF—See Obstetrics.

PREMATURITY

The two important points are:—

1. To maintain the child's body temperature; this is best done by rubbing the body over with Olive oil and then wrapping in cotton wool.
2. Feeding; breast milk is the best and it should be remembered that a premature infant may require up to 50 per cent. more food than a normal infant.

See also Obstetric Nursing.

PRIAPISM

This occurs as the result of injury to the spinal cord, alcoholism, gout, leukaemia and excessive coitus. Treatment is not satisfactory. Bromides may be tried in large doses; failing these, incision of the penis is a possible treatment.

PROCTITIS

May be classified as (1) Acute Catarrhal, (2) Due to specific organisms as Gonorrhoea, Diphtheria, Tuberculosis, and (3) Gangrenous—this is very rare now but was formerly seen after rectal operations. Nos. 1 and 2 should be treated by complete rest in bed, a light diet, sedative suppositories and if the disease becomes chronic then a direct application of silver nitrate, protargol or iodine should be made to the mucous membrane.

PROGRESSIVE MUSCULAR ATROPHY—*See Recent Advances in Medicine.*

PROLAPSE OF THE ANUS AND RECTUM—*See Rectum, Diseases of.*

PROSTATE, ENLARGEMENT OF

This may be (1) Malignant and due to Sarcoma which is very rare and then usually occurs in young subjects, operation is useless and radium gives little hope of success. Or to Carcinoma which is not so uncommon as about 12 per cent. of apparently simple enlargements show this change, but unfortunately there is little hope of success by either operation, radium or deep X-rays.

(2) SIMPLE ENLARGEMENT.—A patient with moderate enlargement by leading a simple regular life and avoiding all causes of prostatic congestion, such as alcohol, venereal excess, constipation and riding may live for several years and avoid both catheter life and operation.

CATHETERIZATION.—This may be necessary for acute retention and from time to time for chronic retention; the intervals may be several months, but with regular catheter life it is seldom necessary to pass the instrument more than twice daily. The catheter, which of course must be most carefully sterilized, should be soft large-bored coudd or bicoudd.

PROSTATECTOMY.—This operation should be advised if a patient has difficulty in, or has to pass a catheter frequently, especially if there is pain or hæmaturia, if attacks of acute retention are frequent or a calculus forms or cystitis supervenes; but always provided that functional tests show the kidneys to be working well, and the patient's general condition is good.

The route is either supra-pubic or perineal; the former is the easier and is a most successful operation. Patients with signs of renal insufficiency from backward pressure should be operated on in two stages, at first the bladder is drained above the pubes, and when the urine increases usually in two to three weeks the prostate is enucleated.

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PROSTATITIS

Acute prostatitis usually follows gonorrhoeal urethritis or urethritis due to the passage of catheters. Chronic prostatitis is most frequently secondary to a chronic urethritis usually gonococcal. The acute condition is best treated by suppositories of morphia and belladonna and hot hip baths; if an abscess forms, it should be drained through the perineum. In the chronic variety all violent exercises should be forbidden, bowels regulated, and a vaccine made which is frequently most effective.

PROTEIN SHOCK TREATMENT—*See* Therapeutic Measures.

PRURITUS

Treatment must be directed to finding out the cause and if possible removing it; first think of parasites and drugs, but it may be due to diabetes, gout or gastro-intestinal disease. The majority of patients are improved by a vegetarian diet excluding coffee, tea, alcohol and all highly spiced foods. Internally Sodium Salicylate alone or combined with Phenazone or Phenacetin or Carbolic Acid in pill.

External treatment should also be employed; one of the most simple and effectual is an evaporating lotion. The following may be tried:—

R Acid Carbolic	3j	or R Acidi Hydrocyanic Dil.	3iss
Glycerine	3ss	Sp. Rosmarini	3j
Aquam ad.	3viii	Glycerine	3ss
		Aquam ad.	3x

℞ Ichthyolis	3ss	℞ Liq. Carbonis Deterg.	3jss
Sod. Bicarb.	3iss	Aquam ad.	℥j
Sp. Lavandulæ	3ss		
Aquam ad.	3viii	Sponge on.	

In very severe cases the withdrawal of 5 m of cerebro-spinal fluid by lumbar puncture often gives immediate relief.

PRURITUS ANI

In the first place a careful examination should be made of the anus and rectum for piles, fissure or polypi. The part should be washed twice daily and after any action of the bowels, being carefully dried and covered with Boric Acid or a little Orthoform powder.

Ointments

℞ Chlorotone	3j	℞ Calomel	3j
Ext. Conii	3j	Lard.	3j
Hydrag. Subchlor.	gr. 8		
Hydrastin	gr. 8	℞ Bismuth Subnitras.	3ij
Cremor Menthyl ad.	3ij	Cocaine	gr. 10
		Hydrag. Subchlor.	gr. 15
		Vaseline	3j

Paint

℞ Picis Carbonis	3j
Benzol	3iv
Acetone	3ij

Powder

℞ Anæsthesin	1 part
Starch powder	2 parts

Recently A.B.A. (Anæsthesin 8%, Benzylalcohol 5%, Ether 10%), an injection of 1 to 8 c.c., made under the skin with a fine hypodermic needle, has been reported as being very effective; ten to twelve treatments are required, only a small area being injected at a time.

Lastly if life is becoming unbearable Bull's operation should be performed. This consists in dissecting up flaps on each side of the anus and thus dividing all cutaneous nerves.

PRURITUS VULVÆ

The cause should be searched for, such as any vaginal discharge, uncleanness, threadworms, sugar in the urine. It should be remembered that it may be the only symptom of carcinoma of the vulva.

Hot alkaline, bran or salt-water baths, thorough drying, and dusting with—

℞ Pulv. Acid Salicylis	gr. 20	℞ Cocaine Hydrochlor.	gr. 5
Pulv. Amyli	3ij	Zinci Oxidi	3j
		Lanolini	3j
℞ Painting with Tr. Iodi.			

R Menthol	3i	R Ichthyol	gr. 20
Ol. Olivæ	3iij	Lanolin	3ij
Chloroformi	3i		
Lanolin	3iij		

PSILOSI—See Sprue.

PSITTACOSIS

There is no specific treatment; the case should be treated on the same lines as for enteric.

PSORIASIS

This is a disheartening condition to treat; some cases are very resistant to treatment, and there is always a great tendency to relapse. In every case care must be taken not only to think out the treatment but to persist in carrying it on.

DIET.—Much has been written on this point, but it is impossible to say except by trial what will suit each particular case; some are better on a vegetarian diet, while others are better on meat; all cases are better without alcohol.

INTERNALLY.—The four remedies which have been most used, are—Arsenic, Sodium Salicylate, Thyroid and Pot. Iodide.

EXTERNALLY.—Chrysarobin is unquestionably a rapid and efficient drug, especially if the patient gives himself up for treatment and goes to bed for 2 or 3 weeks. It must not be applied to the head and neck. Application is made after a bath given to remove the scales, by means of a 4% ointment or the following preparation.—

R Chrysarobin	20 parts	Recently a new preparation, <i>Cignolin</i> , said to have all advantages, with none of the disadvantages of Chrysarobin, is used in a 2 to 5 per cent. ointment with Vaseline.
Ol. Rosæ.	20 parts	
Acid Salicylic	10 parts	
Sapon. Virid.	25 parts	
Vaseline	25 parts	

For the Face and Scalp

R Liq. Pleni Carbonis	3i	R Rosoroin	gr. 20
Acid Salicylic	gr. 15	Vaseline	3i
Vaseline	3i		

X-ray treatment may do a great deal of harm and is best avoided.

PSYCHONEUROSES

This heading includes: (1) Hysteria, (2) Anxiety states, and (3) The obsessive-compulsive neurosis. These clinical forms

may be looked upon as different reactions to the difficulties of life, and in some cases faulty attempts at adjustment. The symptoms of Hysteria and the Anxiety states are the continuation of the ordinary emotional reactions of every-day life. The hysterical state being negative or a retreat from the difficulties of life into illness, while the anxiety state is a positive reaction, but unsuccessful battle to overcome the distress, and includes the majority of cases of what were formerly called neurasthenia. The treatment of hysteria is by suggestion, explanation or psychological analysis and of the anxiety state, rest, tonics, general improvement in health and re-education in the control of life. *See also Hysteria and Neurasthenia.*

In obsessive-compulsive neurosis the patient is compelled to go through varying ritualistic acts, and is powerless to defy the impulses which compel him. The only effective treatment is by psycho-analysis which must be carried out by a specialist.

PTOMAIN POISONING—*See Food Poisoning.*

PUERPERAL SEPSIS—*See Obstetrics.*

PULMONARY TUBERCULOSIS

The following conditions may be Pretuberculous and must not be disregarded in persons likely to develop Tuberculosis:—

- | | |
|---|-------------------------------------|
| 1. Constant succession of Colds. | 9. Exalted sexual appetite. |
| 2. Tachycardia | 10. Anæmia. |
| 3. Albuminuria. | 11. Functional Aphonia. |
| 4. Dyspepsia. | 12. Dyspnoea. |
| 5. Muscular Debility. | 13. Slight Paresis of a Vocal Cord. |
| 6. Suppression of Menses. | 14. Irregularity of the Pupils. |
| 7. Pyrexia persistent. | 15. Pleurisy. |
| 8. Psychological Characteristics—
Difficile. | 16. Urine reflex. |

POST-MORTEM.—A large number of healed tubercular lesions are revealed without any evidence of disease having shown itself during life, and tuberculin tests show the majority of adults as infected. The problem to decide is whether the patient has clinical tuberculosis, *i.e.* a disease that is spreading and requires treatment.

SYMPTOMS.—Symptoms are more important than physical signs, and most suggestive is persistent cough which is present in 45 per cent. of cases. Loss of energy and weight, overtiredness, hoarseness and night sweats are all suspicious. The normal temperature curve is exaggerated so that the temperature is

highest in the evening and lowest in the morning. Hæmoptysis, if the cause is unknown, is an indication, also idiopathic pleural effusion. While physical signs are often misleading, the presence of constant crepitations over the upper part of a lung is practically certain evidence, but on the other hand because no physical signs are found it is quite wrong to exclude tuberculosis. Moreover the diagnosis should be made before the advent of physical signs.

Examination of the sputum should always be made; in the early stages when it is mostly mucous, tubercle bacilli are rarely found, but once the sputum has become purulent tubercle bacilli are almost invariably present; if the case is one of tubercle, other laboratory tests including Tuberculin are not of much value. X-ray is the most important method of examination and early cases show a fine mottling below and external to the middle line of the clavicle.

TREATMENT.—It cannot be too strongly impressed that the basis of treatment of tuberculosis in any part of the body is rest of the diseased part.

1. Acute or very Active Febrile Cases should be either treated in a special disease hospital, or kept at home in bed under careful observation and nursing. When the patient is allowed to get up he must do so very gradually, lying first on a couch and then sitting in a chair, slowly increasing the period each day. When the patient can remain up without any pyrexial reaction for several hours he is ready for Sanatorium treatment.

Even if there is no pyrexia, all cases do better for an initial rest in bed of 2 to 3 months.

2. **SANATORIUM TREATMENT.**—A list of Sanatoria in India will be found in Section VIII. The object of a Sanatorium is to teach a patient how to live a healthy regular life with a combination of rest and graduated exercises, so that he may be in the best position to keep himself fit when he resumes his ordinary life.

3. **HOME TREATMENT.**—For those patients who for any reason cannot leave their homes. The following rules, taken from an excellent book on the subject, by Crowe and Sprawson, in English, now obtainable translated into Urdu from Butterworth and Co., Calcutta, are recommended for guidance:—

Unfortunately, there are as yet very few Sanatoria in India; and even if the number was considerably increased, the great majority of patients will always have to be treated at home, and the following rules have been drawn up for the guidance of these patients.

The three climatic conditions, which the consumptive has to avoid, are: (1) Dust, (2) Wind and (3) Extreme Heat; therefore, if possible, quite apart from Sanatorium treatment, a change of air should be made to avoid these three factors, as far as is practicable. Speaking generally, the climate of Northern India in the cold weather is ideal for the treatment of tuberculosis.

There is one point of great practical importance, that is the great danger to a tubercular woman of becoming pregnant. Every physician of experience has come across dozens of rapidly fatal cases, following pregnancy, and the relapse of cases well on the road to complete recovery.

- (1) LIVE AS MUCH AS POSSIBLE IN FRESH AIR.
—This is the great essential for all cases, without which all other methods of treatment are useless.
- (2) LEARN AT ONCE NOT TO BE AFRAID OF FRESH AIR, EITHER BY DAY OR BY NIGHT.
—As contrary to popular ideas, it cannot possibly do you any harm, provided you are wearing sufficiently warm clothing
- (3) IF YOU SUFFER FROM COLD, KEEP YOURSELF WARM WITH PLENTY OF BLANKETS AND EXTRA CLOTHING; BUT NEVER DIMINISH THE SUPPLY OF FRESH AIR.
- (4) NEVER SLEEP WITH THE MOUTH COVERED UP.
- (5) REMEMBER THAT REST IS THE CURE AFTER THE FIRST ESSENTIAL—FRESH AIR.
- (6) AVOID ALL FATIGUE OF BODY AND MIND
- (7) MAKE UP YOUR MIND TO KEEP AND HOLD A CALM VIEW OF LIFE AND TO AWAIT YOUR CURE PATIENTLY.
- (8) WHEN FEVER IS PRESENT, REST: THE BEST PLACE TO REST IS IN BED, IN THE OPEN AIR, OR ON THE VERANDA.
- (9) TAKE THE TEMPERATURE IN THIS MANNER —The thermometer, even if a half-minute, must be kept in the Mouth for full five minutes, to get an accurate reading in Phthisis.
- (10) BE CAREFUL TO TAKE YOUR TEMPERATURE MOST REGULARLY IN ACCORDANCE WITH

THE CHART AND ALSO THE DIRECTIONS WHICH FOLLOW:—

- (a) On waking in the morning
 - (b) Ten minutes after the morning walk, or at 12 noon
 - (c) Ten minutes after the afternoon walk, or at 6 p.m.
 - (d) Ten minutes after getting into bed at night.
- (11) NEVER FORGET TO SLAKE DOWN THE THERMOMETER, BEFORE TAKING THE TEMPERATURE. SLAKE DOWN TO 97°.
 - (12) TEST EACH STEP IN YOUR ADVANCE BY THE THERMOMETER. THE MORE GRADUAL THE ADVANCE, THE LESS LIKELY THE RETURN OF THE FEVER.
 - (13) WHEN IN DOUBT, REST.
 - (14) REDUCE THE FEVER BY REST.
 - (15) ALL EXERCISE IS TO CONSIST IN SLOW WALKING ON THE LEVEL.
 - (16) NEVER WALK MORE THAN TWO MILES AN HOUR.
 - (17) NEVER TAKE EXERCISE DURING THE HEAT OF THE DAY.
 - (18) IF THE (a) OR MORNING TEMPERATURE IS OVER 98°, YOU MUST REST ALL DAY.
 - (19) IF THE (b) TEMPERATURE, *i.e.* THAT ABOUT MIDDAY, IS 99° OR OVER, REST ALL THE AFTERNOON.
 - (20) IF THE (c) OR 6 P.M. TEMPERATURE IS OVER 99°, REST ALL THE NEXT DAY.
 - (21) IF THE (d) OR BEDTIME TEMPERATURE IS OVER 99°, REST ALL THE NEXT DAY.
 - (22) ALLOW AN INCREASE OF 0.4° IN THE TEMPERATURE IN EACH OF THE ABOVE INSTANCES, IN THE CASE OF A FEMALE.
 - (23) SEE THAT YOUR FOOD IS GOOD, AND EAT AS MUCH OF IT AS YOU CAN.
 - (24) THEREFORE, TRY TO PUT ON FAT.
 - (25) TAKE THREE LARGE MEALS A DAY, AT AS LONG INTERVALS AS POSSIBLE.

- (26) MAKE SURE YOU GET GOOD FOOD AND FRESH MILK—NOT THE ADULTERATED STUFF SOLD IN THE BAZAR.—Buffalo's milk is usually the best for the Consumptive, but the patient should take whatever kind is found by experience to be most easily digested. The practice of adding sugar is best avoided.
- (27) TAKE A SIENR AND A HALF OF MILK DAILY, IF YOU CAN POSSIBLY MANAGE IT.—But as a rule do not take milk between meals, as it interferes with the appetite for the next meal.
- (28) NEVER TAKE FOOD IMMEDIATELY AFTER RISING IN THE MORNING OR AFTER EXERCISE; LIE ON A COUCH IN THE OPEN AIR, FOR ONE HOUR BEFORE THE MIDDAY MEAL AND FOR HALF AN HOUR BEFORE THE MORNING AND EVENING MEALS.
- (29) REST FOR AN HOUR AFTER EACH MEAL.
- (30) WEIGH YOURSELF REGULARLY ONCE A WEEK, ON THE SAME MACHINE, IN THE SAME CLOTHES, AND AT THE SAME TIME OF THE DAY.
- (31) SELECT YOUR DIET FROM AMONG THE MOST NOURISHING ARTICLES OF FOOD.
- (32) NEVER NEGLECT DIARRHŒA.
- (33) KEEP THE GUMS AND TEETH AS CLEAN AS POSSIBLE.—Hygiene of the mouth is very important: all decayed teeth should either be extracted or stopped, and pyorrhœa treated if present. The teeth should be brushed after each meal.
- (34) GIVE UP SMOKING.
- (35) DO NOT PIN YOUR FAITH TO MEDICINES.—There is no specific for Tubercle, like Mercury for Syphilis, but there are many methods which are of much value in conjunction with other treatment, and for special conditions. Tuberculin is a double-edged sword, and while it is very useful in the right class of cases, it is capable of causing great harm when given in the wrong cases, or without skilled and constant supervision, by a physician specially trained in its use.
- (36) DO NOT WASTE YOUR MONEY AND TIME ON PATENT MEDICINES, PROPRIETARY

DRUGS OR MUCH-ADVERTISED APPLIANCES.

- (37) AVOID LATE HOURS.
- (38) CAREFULLY DESTROY ALL PHLEGM BY BURNING.
- (39) REMEMBER THAT YOU ARE UNDERTAKING A LONG CAMPAIGN AGAINST A RUTHLESS ENEMY, AND THAT IMPLICIT OBEDIENCE TO EVERY ORDER IS ESSENTIAL.

4. GRADUATED REST AND EXERCISE.—The basis of this treatment is active immunity; induced by the discharge of tubercle toxins, from the pulmonary lesion, as the result of muscular exercise, these toxins being set free in gradually increasing doses. The Himley Sanatorium method introduced by Paterson has been very successful: there are six grades ranging from walking up a slight slope to hard digging for 6 hours daily. It is essential that this treatment is carefully watched and controlled to prevent excessive auto-inoculation.

5. ARTIFICIAL PNEUMOTHORAX.—The principal is that the lung collapses before the entering gas either purified air, nitrogen or oxygen, into a firm airless structure. The discharges are pressed out of cavities and tubes and thus the symptoms of toxæmia, *i.e.* malaise, sweating, pyrexia are lessened and fibrotic changes facilitated. It is advised in the following cases:—

- (a) Unilateral disease without complication.
- (b) If activity persists in spite of rest with pyrexia on getting up.
- (c) Acute unilateral cases rapidly spreading with high pyrexia; in these cases it is performed to try and prevent involvement of the other lung.
- (d) Cases complicated with tuberculous laryngitis and severe hæmoptysis.
- (e) When the patient's financial means do not permit prolonged treatment by other means.

With disease on both sides the same indications exist, but frequently when the more advanced lung is collapsed the other improves.

See also Recent Advances in Medicine.

6. Treatment by preparations of Gold, the most successful being Sanoerysin-Thiosulphate of gold and sodium; while not

having any direct influence on the tubercle bacillus, it diminishes the quantity of the sputum and the number of tubercle bacilli; it is indicated:—

- (a) In the treatment of patients who are not improving under other treatment.
- (b) To check an acute spread of disease.
- (c) In bilateral cases in conjunction with artificial pneumothorax.

The dose must be most carefully regulated; at the Brompton Hospital a course is given for six weeks, a total of 4·6 g. being divided up into weekly doses of 0·1, 0·25, 0·5, 0·75 and three doses of 1 g.; any severe reaction being avoided.

See also Recent Advances in Medicine.

7. TUBERCULIN.—After an extensive trial in English sanatoria no advantage could be found from its use; it is now practically confined to the treatment of glandular and genito-urinary tuberculosis, good results being obtained especially in the latter group.

8. DRUGS.—Treatment by drugs cannot be regarded as of much benefit with the exception of the treatment of complications, none having a specific effect. The administration by inhalation has now been generally discarded. The more generally recommended drugs are Creosote and Cod Liver Oil. The following prescriptions may be tried:—

R Creosoti	m 2	R Creosoti	m 1
Oleum Morrhuæ ad.	ʒj	Olive Oil	m 5
t.d.s., after food.		Oleum Morrhuæ	m 5
		Syrup Tolu.	m 5

For one capsule.

3 to 7 capsules t.d.s., after food.

The Creosote must be a pure preparation of beechwood creosote and even then it may irritate the stomach and kidneys, and is then either given per rectum or by injection as in the following:—

R Creosote	m 50	R Creosote	m 70
Olive Oil	ʒv	Olive Oil	} aa ʒvj
Yolk of Egg	1	Lanoline	
Distilled Water	ʒvj	Benzoyated lard	

9. CLIMATE—Is not of the great importance at one time considered to be the case. The patient should live in a climate that suits him best on general considerations. For example, it would not be advisable to keep a patient in the great heat of the plains during the hot weather, and the hills at an altitude of about 4,000 feet would probably be the most suitable.

10. DIET.—The patient should not be over-fed; the aim should be to keep his weight at the figure it was before the onset of the disease, and generally speaking while in a Sanatorium he should be fed on the kind of food that he can afford after discharge. Fats are unquestionably of benefit, especially mutton fat; carbohydrates should be limited, and recently a salt-free diet has been advocated.

11. SURGICAL MEASURES.—Other than artificial pneumothorax, are evulsion of the phrenic nerve which results in a hemidiaphragmatic paralysis with partial immobilization of the lung on that side. Thoracoplasty—other immobilization measures having failed the ribs are resected to allow full collapse of the chest wall. These measures are contra-indicated in early and acute cases, but are of benefit in those cases showing resistance by fibroid changes.

12. TREATMENT OF COMPLICATIONS:—

For Anorexia

℞ Sod. Bicarb.	gr. 15	℞ Tr. Nux Vom.	℥ 7
Tr. Nux Vom.	℥ 7	Tr. Cinchonæ	℥ 80
Tr. Gentian	ʒss	Tr. Calumba	℥ 90
Aqua Chloroformi ad.	ʒj	Tr. Gentian	ʒj
One dose before each meal.		In water before meals.	

For the Cough

℞ Heroin Hydrochlor.	gr. 1/24	℞ Syrup Apomorphine	ʒj
Morph. Hydrochlor.	gr. 1/24	Syrup Codeine	ʒj
Apomorph. Hydrochlor.	gr. 1/48	Syrup Picis Liq.	ʒj
Acid Hydrochlor. Dil.	℥ 5	Syrup Pruni Virg.	ʒj
Syrup Pruni Virg.	ʒss	A tablespoonful whenever the cough is troublesome.	
Aqua Chloroformi ad.	ʒss		
Every 4 hours.			

For Diarrhœa

℞ Emetine Hydrochloride, hypodermically.	hypo-	℞ Tr. Krameria	℥ 6
		Tr. Opii	℥ 2½
		Pulv. Cretae Arum.	gr. 3
℞ Bismuth Salicylate, gr. 20, placed on the side of the plate and taken as salt.		Decoct. Hæmatoxylin ad.	ʒij
		One dose after each liquid stool.	

For Night Sweats

℞ Camphoric Acid, 20 to 30 gr., in capsule.	℞ Atropine	gr. 1/100
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FOR PYREXIA.—The first indication is rest. A revised diet with Castor Oil ʒj doses with Tr. Opii ℥ 2 is at times effective. Inunction with Guaiacol ʒj doses over the chest may be serviceable, but should be used with caution as it may cause great depression. Antipyretic drugs should also be used with caution as it is doubtful as to how far the patient benefits; Pyramidon 5 to 8 gr. is probably the best.

FOR INSOMNIA.—If not due to cough the best hypnotics are—R Paraldehydo ʒj to ʒij or R Sulphonal 15 to 20 gr. in a hot drink.

FOR HÆMOPTYSIS.—See the general list.

See also Pulmonary Tuberculosis—Recent Advances in Medicine.

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PURPURA

This is a symptom of an infective or septic nature. The cause, such as a septic focus, should be sought for and removed, the patient being given complete rest in bed with fresh air and good diet; as regards drug treatment, Sod. Salicylate should be given in Rheumatic Purpura, and full doses of Arsenic in the simple form, and an intestinal antiseptic, preferably Mercury, in all cases. In the acute forms of Purpura Hemorrhagica repeated transfusions of citrated blood are the only hope of arresting the hemorrhages in the chronic cases. The injection of 2 to 5 c.c. of blood drawn from the patient's own vein and injected into the gluteal muscles or antidiabetic serum will usually be successful.

PYELITIS

This may be secondary to such conditions as enlarged prostate, calculus or may occur in a previously healthy urinary tract, then it is generally unilateral and more common in women and may complicate pregnancy and is fairly frequent in young children. The patient must be sent to bed and kept on a fluid diet with plenty of water. The pain in the loin which may be very severe should be relieved by fomentations or antiphlogistine. The bowels must be kept active and the urine rendered alkaline by either:—

R Pot. Citrate	ʒj	or R Pot. Citrate	gr. 90
Inf. Buchu ad.	ʒi	Pot. Bicarb.	gr. 90
		Mag. Carb. Pond.	gr. 20
		Inf. Uva Ursi ad.	ʒj
Every 4 hours.			

When the condition has become chronic, *i.e.* when the pain and frequency of micturition have ceased and the temperature has been normal for ten days, then Hexamine may be given, but it must be remembered that it is inert in alkaline urine which must be rendered acid with Acid Sodium Phosphate, and it is always a good plan to change the antiseptic from time to time.

R Hexamine	gr. 12	or R Salol	gr. 12
Acid Sod. Phosph.	gr. 25	Acidi Borici	gr. 10
Tr. Hyos.	ss	Mucilage Tragacanth.	q.s.
Sp. Chloroformi	℥ 15	Aqua Chloroformi ad.	℥j
Inf. Buchu. ad.	℥j		
	t.d.s.p.c.		t.d.s.p.c.

Amm. Benzoate is effective in staphylococcal infections, and Oil of Sandalwood combined with Belladonna for acute infections, more especially with involvement of the bladder.

R Amm. Benzoate	gr. 20	R Oleum Santali	℥ 12
Acidi Borici	gr. 8	Liq. Potassæ	℥ 8
Tr. Hyos.	℥ 15	Tr. Belladonna	℥ 8
Inf. Buchu ad.	℥j	Tr. Hyos.	℥ 45
	t.d.s.	Pulv. Tragacanth.	q.s.
		Aquam ad.	℥j
			t.d.s.

The following are all useful urinary antiseptics: a new drug Hexyl-Rosorcinol or Caprokol 2 gr. in capsule, one to three capsules t.d.s. Cystazol, Cystopurin 15 to 30 gr., Acriflavine $\frac{1}{2}$ to 1 gr. and Helmitol 15 to 30 gr.

PYORRHŒA ALVEOLARIS—*See* Dental Surgery.

QUINSY—*See* Diseases of the Throat.

RABIES AND ANTI-RABIC TREATMENT

BEING AN EXTRACT OF THE INFORMATION AND INSTRUCTIONS ISSUED

By Lieut.-Col. H. B. Shortt, I.M.S., Director of the Pasteur Institute of India

MEASURES TO BE ADOPTED IN THE CASE OF PERSONS BITTEN BY RABID ANIMALS OR THOSE SUSPECTED TO BE RABID

IMMEDIATE MEASURES.

(1) If possible the biting animal should be secured and placed under observation (*see* Section V regarding 10-day period of observation).

(2) The wound should be cauterized as soon as possible. For this purpose the wound should be well washed, with some antiseptic if possible, thoroughly dried and then thoroughly cauterized. It is important that the cauterizing agent should reach every part of the wound and, in the case of deep bites, the bottoms of the wounds should be efficiently treated. The following cauterizing agents may be used; they are given in order of preference:—

Pure carbolic acid.—This quickly destroys any virus it reaches and, being a local anæsthetic, causes only a temporary smarting.

Concentrated Nitric acid.

Silver nitrate.

Permanganate of potash.—In crystals or a saturated solution.

Actual cautery.—A knitting needle or similar piece of iron heated to a dull red heat.

LATER MEASURES.

Antirabic vaccine treatment.—The cauterization, however efficient it has been, does not do away with the need for specific vaccine treatment, should the dog have been rabid. The question therefore now arises 'Should the bitten person receive antirabic vaccine treatment?' This question must be answered after consideration of all the circumstances on the lines described below:—

1. *The dog is dead and was certainly rabid.*—In such a case all persons bitten and all those who have been licked on raw skin surfaces or on mucous membranes by the dog must receive antirabic vaccine treatment.

2. *The dog is dead and was suspected to be rabid.*—It has already been stated that the negative microscopical examination of the brain is not an infallible test and therefore the persons at risk must be given treatment.

3. *The dog is suspected to have rabies but is still alive and can be placed under observation.*—

Under no circumstances must the dog be destroyed; otherwise one of the most valuable signs of rabies, *vis.* the short duration of the illness followed by death of the animal will be lost. The dog should be kept tied up and under observation for ten days. If it remains in *perfect health* for this period it was not infectious at the time of inflicting the bite and no treatment is necessary even should the dog develop rabies at a later

date. Should the dog become ill during the observation period treatment should be commenced at once on the assumption that the symptoms are those of rabies. If the bite is on the head, face or neck, or if the patient is badly bitten elsewhere, vaccine treatment must be commenced at once. It may be discontinued after the ten days' period of observation is over if the dog remains in perfect health. If the dog should die during the ten days' observation period it should be assumed to have been rabid and vaccine treatment should be commenced at once.

4. *The dog is unknown and cannot be traced.*—Under these circumstances, and especially if the attack of the dog was unprovoked, the dog must be assumed rabid and the patient receive antirabic treatment.

5. *The time elapsing between the bite or lick and the application of the patient for advice is three months or more.*—In such cases the probability is that the patient has escaped infection. Treatment is probably unnecessary in such cases but, as the patient may be nervous and likely to worry, it is usually advisable to give the appropriate antirabic vaccine treatment in cases where the dog was certainly or probably rabid, as such treatment is almost invariably innocuous.

6. In any case of difficulty or doubt not covered by the notes given above a detailed letter or telegram describing all the circumstances should be sent to the nearest Pasteur Institute asking for advice.

The code words for telegrams to Pasteur Institutes in India are:—

Pasteur Institute of India, Kasauli	...	Pasteur, Kasauli.
Pasteur Institute of Southern India, Coonoor (Madras)	...	Lyssa, Coonoor.
Pasteur Institute of Burma, Rangoon	...	Virus, Rangoon.
King Edward VII Memorial Pasteur and Medical Research Institute, Shillong (Assam)	...	Rabies, Shillong.
The Antirabic Treatment Department, School of Tropical Medicine & Hygiene, Calcutta (Bengal)	...	Tropmed, Calcutta.
Haffkine Institute, Bombay	...	Research, Bombay.
Antirabic Treatment Department, Prince of Wales' Medical College, Patna (Behar & Orissa)	...	Pasteur, Patna.

METHOD OF ADMINISTERING ANTIRABIC VACCINE

(a) *Sterilisation of the Syringe.*

1. Heat olive oil to 160°C. and suck it up several times into the syringe.
2. Wash out the oil with sterile normal saline solution.

(b) Charging of the Syringe.

1. Shake up the ampoule thoroughly.
2. Heat the end of the neck and jerk up some of the vaccine into it. This cracks the neck.
3. Knock off the cracked portion and hold the ampoule inverted. Draw up the desired dose into the syringe.

(c) Inoculation of the vaccine.

1. Dab tincture of iodine with a swab on two spots on the abdominal wall.
2. Inject half the dose into the subcutaneous tissues in each area.

TREATMENT OF HYDROPHOBIA CASES.—There are no definitely authenticated cases of recovery from hydrophobia and treatment must be directed to alleviation of symptoms. The following general lines of treatment, modified when necessary, should be adopted:—

1. Keep the patient in a quiet darkened room free from draughts. Bright light, sudden sounds and draughts of cold air tend to excite and aggravate spasms.

2. Avoid disturbing patients unnecessarily. Most subjects become excitable and talkative. If this tendency is encouraged it only increases the patient's suffering.

3. If the patient becomes violently excited use a straight jacket. Administer $\frac{1}{2}$ grain morphia, repeated if necessary.

4. If spasms are frequent and marked, morphia in $\frac{1}{2}$ gram doses repeated twice or thrice in 24 hours may be given.

Morphia is well tolerated and there need be no hesitation in giving large doses.

5. Diet.—Feeding is usually impossible but in exceptional cases patients will take some dry solid food sparingly. Fluids invariably provoke spasms.

Nutrient enemata and glucose *per rectum* or intravenously may be given if considered necessary.

For Treatment Centres and methods of sending for Anti-rabic Vaccine see Section 8.

RADIUM THERAPY—See Section II, Therapeutic Measures.

RANULA

This term is usually applied to all cystic swellings of the floor of the mouth. The ideal treatment is to dissect the cyst out completely, but this is extremely difficult on account of the thinness of the cyst walls; remove as much as possible and then allow the cavity to granulate.

RAT-BITE FEVER

The causative agent, *Spirillum Minus*, cannot be found in the blood, the diagnosis must be made from the history of the bite of a rat or cat and the temperature chart. Cauterization of the bite immediately after may prevent infection. One of the organic preparations of Arsenic should be given intravenously early in the course of each paroxysm of fever.

RAYNAUD'S DISEASE

People subject to attacks should eat plenty of fat and meat, avoiding cold in every form and wearing loose warm clothing. Quinine should be given if there is a history of malaria and iodides for syphilis. A local galvanic bath is of great value as a local vascular tonic. Also the application of a tourniquet to the affected limb for one or two minutes twice daily.

RECTUM, DISEASES OF

CANCER.—If the patient's condition is diagnosed early, good results are obtained by entire excision by the perineal or abdomino-perineal route, but unfortunately over 50% of cases, when first seen, are inoperable. Where operation is contra-indicated for other reasons, the growth is inoperable, or in persons over seventy-five years of age good results are possible with radium needles.

COLOSTOMY.—If performed early before there are signs of obstruction, will relieve the diarrhoea, tenesmus and prolong life. Palliative treatment consists of irrigation of the rectum with weak antiseptics; Tr. Ferri Perchlor. by the mouth is said to relieve pain and discomfort, together with anæsthesin ointment introduced by a rectal tube. Recently intramuscular injections of Colloidal Copper 5 c.c. into the buttock is said to retard the growth.

POLYPI OF THE RECTUM.—These should be cut off after ligature.

PROLAPSE OF THE RECTUM.—In children this can generally be cured without operation, but in the adult nothing but operative treatment is of the slightest use. For details see works on General Surgery.

RELAPSING FEVER

The spirochaetes are readily seen in blood films taken at the height of the paroxysm and stained as for malarial parasites.

TREATMENT.—Good nursing is essential, as a special danger as in plague and diphtheria is heart failure, and the patient must be given complete rest both during the febrile period and in convalescence. The specific treatment is one of the organic arsenic preparations intravenously, the dose being estimated on the weight and general condition of the patient; it should be given at the onset or the height of the paroxysm. Novarsenobenzol or Neosalvarsan is generally used.

PREVENTION.—As for typhus the patient should be deloused and isolated.

RENAL CALCULUS—*See* Calculus, Renal.

RETENTION OF URINE—ACUTE

CAUSES.—1. Enlarged Prostate, including malignant disease and inflammatory conditions.

2. Strictured Urethra

3. Stone or foreign bodies in the urethra.

4. Gonorrhoea, tight phymosis, and constricting bands round the penis.

5. Nervous conditions: Hysteria, Post-operative Tabes and Disseminated Sclerosis.

6. Retroversion of the Gravid Uterus and Fibroids.

TREATMENT.—

ENLARGED PROSTATE.—If a large soft rubber catheter fails, then give a hot bath and try a large Coude or Bicoudé. If this fails, next try a large silver prostatic catheter.

Catheterization failing, the bladder should be drained suprapubically until prostatectomy can be performed.

STRICTURE URETHRA.—Catheterization commencing with No. 6 French olivary and working down the scale to the smallest size. This failing, the bladder should be either aspirated or drained suprapubically, or external urethrotomy by Wheelhouse's operation performed; the advantage of the latter is that a radical cure is made of the stricture.

STONE OR FOREIGN BODIES should be pressed back into the bladder, removed with urethral forceps through a slit meatus,

or directly cut down upon and extracted, no sutures being necessary.

RETRO-PHARYNGEAL ABSCESS—*See Abscess.*

RHEUMATISM, ACUTE

An infection of uncertain pathology probably streptococcal and through the tonsils, but on account of the uncertain pathology direct treatment by serum or vaccine is not possible. There is a strong inherited predisposition. Sodium Salicylate should be given in sufficient doses with alkalies, the bowels being kept open at the same time; up to 80 gr. of Sod. Salicylate with 30 gr. of Sod. Bicarb. can be given every 4 hours for the first 2 or 3 days and then reduced to 6-hourly doses, and smaller doses for 4 weeks after the temperature is normal to prevent relapse. A careful watch should be kept on the heart. The after-care should be a constant watchfulness for indefinite pains and signs of ill health, which may indicate a return of infection. The question of removal of the tonsils is a knotty point; unhealthy tonsils should be removed, but acute rheumatism has followed the operation also chorea.

RHEUMATISM, CHRONIC—*See Fibrositis.*

RHEUMATISM, GONORRHOEAL—*See Gonorrhoeal Rheumatism.*

RHEUMATOID ARTHRITIS

This condition has been ascribed to an infective condition, disordered metabolism, vitamin deficiency, a disorder of the endocrine sympathetic system and even allergy. It is usually seen in young women who are thin and toxic looking leading an inactive life. It begins in the small joints of the limbs, bilaterally often symmetrically and acutely, and spreads towards the body. Treatment should be directed to finding any of the above possible factors, and if a septic focus is found it should be eliminated, and a vaccine given. If the cause is glandular, thyroid, parathyroid and ovarian extracts should be administered. The value of drugs is doubtful except as analgesics and hypnotics. Iodine and Sulphur have been strongly advocated; perhaps the best method is to give on alternate days Collosol Sulphur and Collosol Iodine 3j doses t.d.s. As the stools frequently contain *Entamoeba Histolytica*, Emetine is sometimes of value.

Endless physical methods have been recommended including galvanism, faradism, diathermy, light vapour and hot-air

baths, sand packs, heliotherapy, etc.; but probably the best results are obtained from diathermy and dressings with Scott's ointment. In the early stages rest should be given and no inflamed joint should be allowed to bear any weight, but when all active inflammation has subsided, much can be done to restore function by gentle massage and movement.

Recently many cases have been treated by Protein Shock either with intravenous Typhoid vaccine (Typhoid bacilli 100 M, Bacilli Coli 25 M) or with Milk injections. The milk is heated in a closed vessel at 100° in boiling water for 20 minutes and then filtered. The first dose is 4 to 6 c.c., second 5 to 8 c.c., third, fourth and fifth 7 to 10 c.c., given deeply into the gluteal muscles at intervals of 3 to 7 days. Milk is less effectual, but less severe than typhoid vaccine. For further details see Poyntis and Schleniger's *Recent Advances in the Study of Rheumatism* (Churchill).

RHINITIS—See Diseases of the Nose.

RICKETS

The child must be placed under good hygienic conditions of ventilation, clothing and bathing with abundance of sunlight. Any catarrh of the stomach or intestinal tract should be treated, and the diet adjusted so as to reduce the starchy constituents and increase the protein and fat, and this is done by giving more milk and cod liver oil; a child of 2 years should get at least two pints of milk daily, in addition there should be the yolk of an egg and some raw meat juice. In severe cases Irradiated Ergosterol 1 mg. daily. With the exception of iron for anæmia and cod liver oil, drugs are useless.

RINGWORM

The spores of *Tinea Tonsurans* are in the hair of the scalp and epilation is essential in treatment and is carried out by the help of X-rays. Recently a new method of epilation has been produced by the internal administration of Thallium Acetate. These methods of treatment are beyond the resources of the majority of the practitioners for whom this book is written and more simple methods must be considered.

First the child's hair should be cut short, not shaved, and the diseased areas identified. The head should be scrubbed daily; this mechanically removes a good deal of fungus. Then one of the two following ointments should be well massaged into the scalp, morning and evening, with the thumbs:—

R Hydrarg. Amm.	ʒss	or R Resorcin	gr. 30
Sulph. Præcip.	ʒss	Creosoti	m 15
Acid Salicylici	gr. 20	Sulphur Præcip.	ʒj
Vaseline	ʒss	Lard	ʒj
Lanoline	ʒss		

R Tr. Iodi. painted on.

R Formalin	40 per cent.	R Ohrysarobin	ʒj
Rubbed in well for a few days with a brush for ten minutes on alternate days. This is very efficient but severe.		Adipis Benz.	ʒj
		This is useful for chronic cases, but the face must be protected.	

RODENT ULCERS

Complete removal by operation gives excellent results. Radium is certainly a satisfactory method, and next to these comes X-rays.

ROSACEA

A vascular engorgement of the skin of the face. One of the two following prescriptions should be tried:—

R Calamina	ʒiiss	or R Resorcini	gr. 10
Sulph. Præcip.	ʒiiss	Sulphuris	gr. 10
Glycerini	ʒj	Zinci Oxide	ʒij
Aquam ad.	ʒiv	Pulv. Amyli	ʒij
		Lanolini	ʒij
		Vaselinii	ʒij

ROUND WORMS—See Worms, Intestinal.

SALPINGO-OOPHORITIS

During the acute stage complete rest in bed, with hot fomentations or turpentine stupes. Laxatives and hot douching will generally suffice and no operation will be necessary. Apart from pyosalpinx an inflamed tube may have to be removed on account of pain and recurrent attacks of pelvic peritonitis.

SAND-FLY FEVER

Is closely related to Dengue and should be regarded as belonging to the same disease group. It is caused by a filtrable virus conveyed from man to man by sand-flies; the chief symptoms resemble Dengue, but differ from it in that secondary rashes and rises of temperature are less common and a more lasting immunity is conferred.

TREATMENT.—There is no specific remedy, and should be conducted on the same lines as for Dengue.

SCABIES

This can be rapidly cured by Hardy's method:—

- (1) Scrubbing with soap and water, and a brush, for 20 minutes
- (2) The same for 30 minutes, the parts being completely immersed in soapy water.
- (3) The following ointment is rubbed in:—

R Carbonate Potash	...	...	gr. 25
Sulphur	.	...	gr. 50
Lard	.	...	3v

- (4) This is left on for 2 hours, the parts again being bathed, but not brushed.

R Sulphur ointment is best reduced in strength by mixing it with an equal quantity of Benzoated Lard.

R Balsam of Peru 3 parts; Glycerine 1 part. For painting; is a good application.

R Tr. Benzoin painted on, stops the itching, and the eruption rapidly improves.

R Menthol ointment, 2 per cent., stops the pruritus.

SCALDS—See Burns and Scalds.

SCARLET FEVER

This is a comparatively rare disease in India and has not the high infectivity of Europe. In the few cases that have come under my treatment the infection could be definitely traced to clothing, etc. that came from England. Serum treatment is unquestionably successful and, if given before the third day, is very effective in preventing complications, 10 to 50 c.c. of the concentrated serum subcutaneously, but in urgent cases give intramuscularly or even intravenously. A second injection may be necessary in 24 to 48 hours if improvement is not very marked. If only unconcentrated serum is available three times the amount should be given. No drugs have any specific value, but are useful in treating complications on general lines.

SCARS

Some scars tend to become more prominent and hypertrophic as time goes on; much, however, can be done to promote the ab-

sorption of scar tissue, to raise it to the surface, and to increase its vascularity thus making it much less conspicuous. Bier's suction glasses draw the scar up to the surface and increases its vascularity, this hyperemic treatment is assisted by the injection of Fibrolysin every four days, and the surface of scar tissue can be smoothed down by Resorcin 30% bassorins.

SCHISTOSOMIASIS—See Bilharziasis.

SCIATICA

Is a term which has been made to cover any kind of pain in the thigh, hip or buttock, it should be limited to pain in the distribution of the sciatic nerve, it may be due to a neuritis of the nerve, or caused by pressure on the nerve from tumour of the rectum, pelvic organs, or vertebral column, a similar pain is caused by disease of the hip, sacro-iliac joints, arthritis of the lumbar vertebrae and scoliosis. The best test for a real neuritis is tenderness on pressure on the nerve most marked in the region of the sacro-sciatic notch, and disappearance of the ankle jerk.

TREATMENT.—In acute stage rest in bed is essential, splints are rarely tolerated. Heat should be applied in the form of diathermy or ultra-violet if possible, failing this hot sand bags. Search should be made for any septic focus, an unsuitable chair or saddle may be the cause and in some cases constipation.

DRUGS.—After a preliminary dose of Calomel and Saline give a combination of analgesics such as:—

R Codeine	gr. $\frac{1}{2}$	or R Pyramidon	gr. 6
Caffein	gr. $\frac{1}{2}$	Codeine	gr. $\frac{1}{2}$
Aspirin	gr. 4	Aspirin	gr. 4
Phenacetin	gr. 4		

After the pain has somewhat subsided, give either a combination of Quinine and Pot. Iodide, or Sod. Salicylate and Gelsemium as in the following mixtures:—

R Pot. Iodide	gr. 8	R Sod. Salicylate	gr. 12
Quinine Sulph.	gr. 1	Tr. Gelsemium	m 10
Acid Sulph. Dil.	m 1	Tr. Cardamoms Co.	m 80
Aqua Chloroformi ad.	℥ss	Aqua Chloroformi ad.	℥ss

The Gelsemium is pushed until the pain is relieved or symptoms of poisoning appear the first of which is ptosis.

If after three or four weeks' treatment on these lines, the case does not clear up, the nerve should be injected with normal saline solution, and repeated in three or four days, the best site is just below the sacro-sciatic notch, and the quantity 80 to 100

e.g., it is important to be sure that the needle has entered the sheath of the nerve. Another useful method is massive injection of Oxygen, but stretching of the nerve by forcible manipulation is seldom of benefit.

SCLEROSIS, DISSEMINATED—*See* Disseminated Sclerosis.

SCOLIOSIS

This is a lateral curvature of the spine with rotation of the vertebræ. This condition must be classified as (a) Postural and (b) Structural. The former is generally seen in patients with round shoulders, general ill health and muscular debility. Treatment should be directed to improving the general health and muscular tone with exercise, at the same time searching for any possible asymmetrical movement as the cause.

In Structural Scoliosis.—Once the deformity has become fixed by the loss of shape of the bodies of the vertebræ it is impossible to get rid of the lateral curvature. The following treatments may be tried: (1) Plaster jackets; (2) Corsets; (3) Supports. For details see a work on Orthopædic Surgery.

SCURF—*See* Seborrhœa.

SCURVY

The first essential is to get the patient into good hygienic surroundings, with plenty of fresh air, warmth, and avoidance of damp. A complete change of diet so that the patient is getting fresh fruit, vegetables and meat; with cyder or lemonade made from fresh lemons to drink. A powerful antiscorbutic is fresh infusion of malt.

SCURVY, INFANTILE

This can be completely cured very quickly by a change in diet, no drugs are advisable or necessary. Give unboiled milk and every day orange juice, and a small quantity of meat juice, if orange juice is not available give the juice of tinned tomatoes or that scraped from the surface of raw swedes. Also the flowery part of baked potato, i.e. that part just under the skin.

SEA SICKNESS

Before starting on a sea voyage it is advisable to have a simple diet with regulation of the bowels, and as Ketosis has something to do with the condition a good deal of extra sugar should be taken and a tight abdominal belt is also a help. Once

on board it is essential to keep very warm and to take a good meal preferably of ham and toast. As regards drugs for a short journey such as crossing the channel the worst sufferers may escape any symptoms with a good dose of the Bromide either alone or combined with Chloral. Suppositories are prepared of these drugs by Messrs. Allen and Hanbury and can be inserted by the patient. Chloretone is valuable 5 to 10 gr. in cachet, one an hour before starting and another on going on board; Atropine is one of the best drugs for long voyages as it can be continued for several days. Dose 1/100 to 1/50 gr. as tablet or pill.

In the most severe cases with collapse Morphia up to as much as $\frac{1}{2}$ gr. must be given and combined with Atropine 1/100 gr. Other useful prescriptions are:—

R Cocaine Hydrochlor.	$\frac{1}{2}$ to 1 gr.	R Pot. Bromide	gr. 30
Chloroform	m 20	Chloralamide	gr. 30
Tr. Cardamoms Co.	3j	Liq. Ext. Glycyrrh	3ss
Aquam ad.	3jss	Vinum Xerici	3iv
(Burney Yeo.)		Aqua Dest. ad.	3j

SEBORRHŒA

This has to be considered under Seborrhœa of the scalp and the body. Of the scalp there are two kinds, one makes the scalp very oily, this can be kept under by washing the scalp twice a week with a good shampoo and applying a spirit hair lotion such as the following:—

R Resorcin	...	...	...	3j
Etheris	...	...	...	3j
Eau de Cologne	...	...	...	3ss
Spiritus Rect.	...	...	...	3j
Aquam ad.	...	...	...	3vj

The other form of scalp Seborrhœa is due to epithelial scales and is known as scurf or dandruff and is often a sign of premature baldness. After the scalp has been well cleaned one of the following is applied:—

R Sulph. Præcip.	3iij or this Lotion	R Oleum Ricini	3j
Oleum Theobrom.	3iv	Resorcin	3j
Oleum Ricini	3ix	Acidi Salicylici	3j
		Eau de Cologne	3j
		Spt. Rect.	3ij
		Aquam ad.	3vj

SEBORRHŒA OF THE BODY—is seen down the middle line of the chest and back and in the groin and axilla. It is easily cured by the following ointment:—

R Salicylic Acid	...	...	...	gr. 10
Sulphur Præcip.	...	...	...	gr. 10
Vaseline ad.	...	...	...	3j

SEPTIC THROAT

I have adopted the following treatment, first recommended by Leonard Williams, for many years with excellent results.

A good Calomel purge followed by saline 12 hours after.

The Throat Paint

R Tr. Aconite	m 2	R Hydrogen Peroxide	3vj
Pot. Chlorate	gr. 2	Distilled Water	3ij
Liq. Ferr. Perchlor.	m 10	The throat to be painted every two hours alternately with the mixture.	
Liq. Hydiarg Perchlor.	m 5		
Liq. Strychnine	m 2½		
Glycerine	3j		
Aqua Chloroformi ad.	3j		

Every two hours.

When the temperature is normal the Tr. Aconite should be excluded, but the other ingredients of the mixture continued for another 48 hours.

SEPTICÆMIA AND PYÆMIA

The essential condition in Septicæmia is a multiplication of micro-organisms in the blood and the interaction between them and the tissues. In Pyæmia there is Septicæmia plus the collection of the organisms at certain foci in the tissues, and these foci usually break down to form abscesses.

Treatment may be summarized under:—

1. IMMUNO-THERAPY.—(1) Vaccines; (2) Specific antisera which are bactericidal; (3) Or a combination in Sensitized Serum; (4) Immuno-transfusion. See also Vaccines and Serum Therapy, under Specific Therapy.
2. THE INJECTION OF CHEMICAL SUBSTANCES HAVING BACTERICIDAL PROPERTIES.—Of these Collosal Argentum 1 to 2 c.c. of a 1 in 2,000 solution intravenously on successive days is the best in streptococcal cases; while in staphylococcal case Collosal Manganese is more successful. The direct injection into the blood stream of such antiseptics as Eusol has had little success.
3. PROTEIN SHOCK either by Typhoid vaccine or milk may be used in cases in which the more acute symptoms have subsided. Chemical Shock may be given by such preparations as S.U.P. 86.

4. OPERATIVE MEASURES.—Such as washing out a suppurating joint with saline or Dakin's solution but not draining it. Opening abscesses, etc.
5. GENERAL MEASURES.—Such as complete rest, ample diet, abundance of fresh air and sunlight, these measures should be invariably carried out, no matter what other treatment is adopted.

The treatment of Pyæmia is that of the accompanying Septicæmia plus the drainage of secondary foci of suppuration.

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SEPTICÆMIA, PUERPERAL—See Obstetrics.

SERUM SICKNESS—See Specific Therapy.

SERUM THERAPY—See Specific Therapy.

SEXUAL IMPOTENCE—See Impotence, Sexual.

SHOCK

TREATMENT.—The object in view is to keep the patient alive while the cardio-vascular centre in the medulla has time to recover from its profound depression which has resulted in a fall of blood pressure, the degree of shock being estimated by the extent of the fall.

Treatment is both Prophylactic and Curative:—

A. PROPHYLACTIC

Operative shock is best avoided by:—

- (1) Keeping the patient warm, warm clothing, long stockings, hot water bed to operating table, or flat hot water cushions. Temperature of the theatre 65° to 75°F.

- (2) Avoid over-starvation, purgation and unnecessary disturbance of patient.
- (3) The mental condition is important. The patient should be kindly treated reassured as to the result, not kept waiting, and an injection of Morphia given before going into the theatre; this not only calms the patient, but less anæsthetic is necessary.
- (4) Injection of saline is important if the patient has lost a large amount of fluid, but not otherwise; if there is any question of acidosis, the infusion must be alkaline.
- (5) Afforent impulses from the operation area are prevented by the injection of a weak solution of local anæsthetic (Crile Anoci-Association) and careful selection of the general anæsthetic.
- (6) The surgeon, during the operation, should avoid unnecessary exposure, be gentle in handling and quick in operating.
- (7) There must be no pulling, tearing or crushing of the tissues, greater care being taken in such areas as the upper abdomen, round the anus, and in the throat.

B. CURATIVE

- (1) Warmth is the first essential, with hot blankets, and bottles, but care must be taken that the heat is not excessive; otherwise, there will be sweating, with further fall of blood pressure.
- (2) The patient should not move in any way, being kept in complete rest, with a hypodermic of morphia if there is restlessness or pain.
- (3) SALINE INFUSION—which can be given per rectum, subcutaneously or intravenously, and in all severe cases, should be given in the latter way at a temperature of 100° F.
- (4) TRANSFUSION OF BLOOD—if the patient has lost a large quantity of blood; this is especially valuable, if the wound is likely to be infected, as the transfused blood will help to combat the infection.

It is important to remember that neither Saline Infusion nor Blood Transfusion should be used unless there has been severe hæmorrhage or other loss of fluid, *i.e.* profuse sweating,

the latter being of importance in the tropics; otherwise, the venous circulation and right side of the heart will be still further embarrassed.

(5) MEDICINAL.—Pituitary Extract and Adrenalin are the only two stimulants permissible in the treatment of shock, but the rise of blood pressure is not sufficiently sustained to be of benefit in severe cases. Strychnine and Alcohol should not be given.

SHOULDER, DISLOCATION OF

Over 50% of all dislocations are of the shoulder joint. The displacement may be forward, downwards, backwards or possibly upwards. The accident usually occurs in middle aged men, it is rare under 20 years of age. Reduction should be performed as soon as possible under general anæsthesia by Kocker's manipulation method, which is safer and more efficient, but should this fail traction with the heel in the axilla should be tried.

SINUSITIS, ACCESSORY—*See* Nose, Diseases of.

SKULL, FRACTURES OF—*See* Head Injuries.

SLEEPING SICKNESS—*See* Trypanosomiasis.

SLEEPLESSNESS—*See* Insomnia.

SMALLPOX

If you are called to see a patient who has been taken suddenly ill with severe pyrexia, intense pain across the loins, and vomiting, it is practically sure to be a case of smallpox. Smallpox among unvaccinated European children in the tropics is generally hæmorrhagic and the most terrible disease imaginable, the unfortunate patient is swollen, black and bleeding from almost all mucus membranes. Fortunately it is invariably fatal in a very short time. It is important to remember that if vaccination is performed within forty-eight, or in some cases within seventy two hours of being exposed to infection it will prevent the disease. There is no specific treatment, which is entirely symptomatic, no drug either externally or internally can modify the eruption or prevent scarring, red light is not the success that it was at one time claimed to be.

SNAKE-BITE

The following are instructions for the treatment of Snake-bite by Lieut.-Colonels Hugh Acton and R. Knowles, I.M.S.

Revised, May 1934, by Sir Lenard Rogers, M.D., F.R.C.P., F.R.S.

1. A medical practitioner in charge of a hospital where snake-bite cases are likely to be brought in, would be well advised to always keep the following articles:—

- (1) A Rubber Ligature, as an Esmarch's bandage (stout rubber tubing will do equally well and can be clamped with strong artery forceps).
- (2) An Infusion Apparatus for injecting the Antivenene intravenously.
- (3) A 10 c.c. Roux syringe for injecting the Potassium Permanganate, Bleaching Powder, or Gold Chloride Solutions.
- (4) Potassium Permanganate Crystals, Bleaching Powder, for making a 5% Solution, and Gold Chloride 15 grains of the crystals in sealed tubes, this quantity dissolved in 20 c.c. of sterile saline solution will give a solution of approximately 5%.
- (5) Standard Antivenene.

2. The next essential is for the practitioner to be able to recognise whether the bite is due to a poisonous or a non-poisonous snake.

The most reliable method of telling what kind of snake the bite is due to, is, if possible, to get the snake. The ordinary text-book description of diagnosing the character of the biting snake from the pattern of the teeth marks, is quite useless, or very nearly so. The fine needle-like fangs of the krait may leave no visible mark. A poisonous snake which gets a good grip, may leave the imprint of several teeth, and possibly also of accessory fangs. A non-poisonous snake, which gets but a little grip, may leave only one or two light punctures. The only method of attempting to differentiate between the two classes, Colubrine and Viperine, is to pay attention to the symptoms shown by the patient. These may be summarized as follows:—

In cases of COLUBRINE BITES (Cobra, Krait, and King Cobra):—

- (a) LOCAL SYMPTOMS.—Burning pain, which soon passes off and is replaced by local anaesthesia, which tends to spread up the limb. The bite is usually on a finger or toe. Local paresis. Local oedema, which is often very marked. On incision into the site of the bite, the tissues show only local oedema, and congestion.

- (b) GENERAL SYMPTOMS.—In order of appearance:—ptosis; staggering gait; inco-ordination of speech; parosis of extremities; falling of the head; complete paralysis of all the voluntary muscles; asphyxial symptoms; convulsive seizures in cobra bite; failing respiration without convulsions in krait bite; stoppage of respiration; cardiac failure in from half to thirty hours after the bite.

In cases of VIPERINE BITES (Russell's Viper, *Echis Carinata*, Green Pit Viper and Himalayan Pit Viper):—

- (a) LOCAL SYMPTOMS.—Persistent pain, constant and incessant oozing of hæmolysed blood from the punctures; this is the most characteristic of all local symptoms. On incision into the site of the bite, the tissues, from the effects of clothing, hæmolysis, etc., show a condition resembling red currant jelly.
- (b) GENERAL SYMPTOMS—are those of multiple hæmorrhage and cardiac failure.—Epistaxis is frequently seen. Patches are often extensive. Hæmaturia and melæna may be met with; also purpura, sub-conjunctival hæmorrhages and hæmoptysis. Death takes place within a few hours from cardiac failure or from 2 to 7 days from hæmorrhage. The administration adrenalin and calcium salts intravenously, as for acute scurvy ('Indian Medical Gazette,' February, 1910), may be tried in treatment.

8. The remedies we have at our disposal may be classified as follows:—

- (i) AMPUTATION—should be used for bites on the fingers and toes, if the patient is seen within 10 minutes of the bite—and only in cases of cobra, krait and Russell's viper bites. The doctor has rarely the opportunity to see these cases, if the operation is performed, it is usually carried out, with a scythe or hunting knife by the patient himself.
- (ii) LIGATURE.—The value of an efficient ligature cannot be overestimated; it should be applied within 10 minutes of the bite, and should obstruct the whole of the circulation below it. This allows at least half an hour longer for the application of local and systemic remedies.

- (iii) Acton and Knowles obtained favourable results in animal experiments by injecting strong black solutions of Permanganate of Potash at and around the site of the bite, which they found more effective than Lauder Brunton's method of incision and rubbing in the crystals with moisture, which does not diffuse through the tissues as well as solutions. In the absence of a syringe, the crystals locally still give the best chance, and Hamilton Fairley, who has done much recent work on snake poisoning in Australia, at an unpublished popular lecture, mentioned more than one case in which experimentists bitten on their fingers, who used the incision and K_2MnO_4 local application immediately, showed no symptoms of poisoning.

A 5% Bleaching powder is nearly as efficacious as Gold Chloride, the latter produces gangrene.

(iv) INTRAVENOUS INJECTION OF ANTIVENENE.—

It is known that 100 c.c. are capable of neutralizing 80 milli-grammes of cobra venom, and almost twice the quantity of daboia venom, this is the Kasauli serum, and is made by the use of cobra and daboia venoms, and is therefore mainly of use against those two forms of snake-bite, but it has a slighter degree of action against other forms. For Rogers showed years ago that Calmettes antivenene, made with cobra venom alone, had some action against both sea snake, hamadriad and the common krait venom, all colubrines, although it is less than in cobra poisoning.

An echis antivenone is being prepared by Parel Laboratory, and, should cure most of the cases, if administered within a reasonable time after the bite.

4. The cases of Snake-bite, which will have to be treated, will fall into four groups:—

- (i) Bite on a finger or toe, seen immediately, and due to a certainly poisonous snake.—In such cases (1) ligature; (2) amputation; (3) if the snake be known to be a cobra or Russell's viper, 50 c.c. of antivenene may be given (intravenously) as an additional precaution, if considered necessary.
- (ii) Bites on a fleshy part from a known and certainly poisonous snake.—Such cases will usually be

viperine bites. In such cases (1) ligature if the bite is on a limb; (2) inject into the site of the bite 10 c.c. of a 5 per cent. solution of gold chloride, or bleaching powder, trying to infiltrate, as far as possible, the whole area around the bite with the drug; (3) if the snake be believed to be a Russell's viper, give at once 50 c.c. of antivenene intravenously. If the biting snake be a cobra, then give 100 c.c. of antivenene intravenously.

(iii) Bite on a finger or toe, from a known and certainly lethal snake, seen after some time.—Here amputation is useless as a fatal dose of venom is probably already in the general circulation. Under such circumstances: (1) Ligature; this will lock up any venom still left at the site of the inoculation within the bitten limb. (2) Inject locally $1\frac{1}{2}$ to 2 c.c. of a 10 per cent. solution of gold chloride, or bleaching powder, trying to impregnate all the tissues, at the site of the bite, by repeated small hypodermic injections. (3) If the snake be believed to be Russell's viper give at once 50 c.c. of antivenene intravenously; if a cobra, give 100 c.c. of antivenene intravenously, and repeat if necessary.

(iv) Bite from a snake, where nothing can be learnt, as to the nature of the snake, whether a poisonous one or not.—In such cases (1) ligature; (2) inject into the site of the bite 2 or 3 c.c. of a 10 per cent. solution of gold chloride. More should not be given, as if the snake be a poisonous one, a small injection will cause less gangrene than a large one; (3) give 30 to 40 c.c. of antivenene intravenously. An alternative line of treatment in such cases will be to do nothing more than to watch the patient very carefully, and, if symptoms of venom poisoning ensue, to apply the line of treatment indicated for group (iii) or (iv).

5. Many of the cases seen in Clinical Practice will fall into Group (iii) or (iv).

In the case of a bite from the green-pit viper, or from the Himalayan pit viper, since these snakes never give a dose fatal to man the only treatment necessary is the application of hot fomentation impregnated with belladonna. In the case of echis bite, amputation is scarcely needed, as about 50 to 60 per cent. of cases receive non-lethal doses.

The administration of Antivenene is only of use against cobra and Daboia bites; and not in bites from other snakes. The most difficult cases of all to treat are cases of krait bite; here the venom is sixteen times as toxic as cobra venom; and antivenene is useless. Fortunately such cases are in reality rare, though reported cases of bite by supposed kraits, usually lycodons, etc., are common enough.

In all cases, after adopting the appropriate line of Treatment, the patient should be carefully watched. If symptoms of venom intoxication ensue, another 50 c.c. of Antivenene should be given intravenously, and this dose repeated a third time if required. As a monkey will stand 1·7 per cent. of its body-weight of antivenene, without showing symptoms, it is likely that 300 c.c. could be safely given to a man of standard weight. If respiration fails, artificial respiration and ozone administration should be resorted to; and a further intravenous injection of Antivenene given. It may be pointed out that, if the remedies at present in existence against snake-bite are properly used, it should be quite possible to save from 60 to 70 per cent. of all cases which now prove fatal.

6. CONCLUSION.—The general line of procedure should be as follows:—

- (1) Apply a firm ligature immediately, and amputate if finger or toe and if the snake is identified as really lethal.
- (2) Impregnate forcibly the whole area of the bite with Potassium Permanganate solution or failing this Bleaching Powder 5% solution or Gold Chloride, but it must be remembered that the latter invariably destroys the tissues at the site of injection.
- (3) Inject from 100 to 200 c.c. of Antivenene intravenously, if the biting snake be suspected to have been a cobra or a Russell's viper. If symptoms of venom intoxication come on, further and even larger injections of Antivenene should be given intravenously.

With sera concentrated ten times, a dose of 20–60 c.c. should save every case of cobra bite.

The Indian Research Association have shown that antivenomous serum which had kept for 2 years under different storage conditions had very high potency.

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SPERMATORRHOEA

Spermatorrhoea is a misnomer and should be eradicated from all medical literature, it means an escape of seminal fluid at times other than during a sexual organism, if it exists it is extremely rare. The following conditions frequently give rise to the fear that the patient is suffering from this much dreaded disease, seminal fluid squeezed out from the seminal vesicles by hard faeces during defaecation, the muco-pus of urethritis, the milky deposit of phosphates, the normal mucus cloud of urine, escape of a little prostatic fluid, or frequent nocturnal emissions.

SPINAL ANALGESIA—See Special article on Anæsthetics.

SPINE, CARRIES OF

As for tuberculosis in other parts of the body the general treatment by open air, sunshine, and ample nourishing diet and cod-liver oil is of the first importance. The next is absolute and above all uninterrupted rest, this can be obtained by recumbency the patient being fixed on a firm bed, and the spine stretched on a firm pillow, the recumbent position must be maintained for at least a year. In some cases especially in children Phelps's box or a gas-pipe frame on a plaster bed can be used which has the advantage that the patient can be carried about. No attempt should be made at a rapid correction of the deformity as this would light up further trouble. It is now advised by many surgeons that the only method of giving absolute rest to the spine is to copy nature's cure, and ankylose the spinous processes or laminae of the diseased vertebrae together and to the healthy vertebrae above and below the lesion, this is accomplished by either Hibbs's operation or bone grafting by Albee's method, for the details of which see works on General Surgery.

SPLEEN, RUPTURED

Rupture of an enlarged malarial spleen may cause death from hæmorrhage in a few minutes; but, on the other hand, urgent symptoms may be delayed for several hours. These cases are very important from the medico-legal standpoint, and frequently give rise to considerable controversy.

Examples of cases which have come under the writer's notice:—

A coolie running along the railway line caught his foot in a signal wire and fell across a rail. Urgent symptoms immediately supervened and the man died within 20 minutes. The spleen was enormously enlarged. A syce received a comparatively slight blow on the abdomen. He did his work and did not complain until 6 hours after the injury, when the symptom gradually became much worse, death taking place after 15 hours.

A punkah cooly was struck in the abdomen about midnight. Next morning at 10 a.m. he started to walk to his home—a distance of 7 or 8 miles. He walked the first 3 or 4 miles, then rode a pony. He collapsed and died on reaching his house.

Post-mortem on these cases showed very extensive rupture, which would have caused rapid death. The explanation apparently is that the injury causes a hæmorrhage into the splenic substance, which ultimately ruptures the splenic capsule by distension.

SYMPTOMS.—Signs of abdominal injury with severe internal hæmorrhage. The blood causes dullness in the splenic area which steadily increases.

TREATMENT.—Immediate operation is the only hope, the surgeon standing on the right side, makes a free incision in the left linea semi-lunaris. The spleen being exposed a clamp is at once placed on the pedicle. If there are no adhesions the operation is simple, but when present, the operation is long and tedious as all adhesions must be divided between double ligatures, then the spleen is turned forward and to the right, the gastro-splenic omentum and lienorenal ligament being divided between ligatures, care being taken that the tail of the pancreas is not injured.

The pedicle is now dealt with from the posterior aspect and working from below upwards, the vessels being separated with the fingers and double-ligatured, tension on the pedicle being spleen.

If oozing is feared, the cavity left by removal of the spleen should be packed with gauze; otherwise, the abdomen should be closed. No serious ill effects follow the removal of the spleen.

SPLenic ANÆMIA—See Leukæmia.

SPRAINS

Treatment should be directed to:—

- (1) The relief of pain by alternate soaks of hot and cold salt and water, by raising the limb, and by placing it in the normal position of rest which is the most comfortable.
- (2) To prevent or limit extravasation or if it has already occurred to assist its early absorption. Cover the part to the thickness of $1\frac{1}{2}$ inches with cotton wool and apply tightly a crepe bandage, but never a strong rubber bandage.
- (3) To obtain satisfactory healing of the injured parts, and to restore the full degree of normal movement, active voluntary movements should be started from the beginning, later against resistance, and massage with warm Camphorated Oil at the end of the first week. Exposure to light and heat are also helpful.
- (4) No fixed apparatus or splints should be used, as they only lead to atrophy and stiffness.
- (5) If the affusion shows signs of persisting later the application of Scott's dressing is of value.

A radiogram should be taken in all cases as a measure of safety against possible fracture.

SPRUE (PSILOSIS)

There is no specific treatment and it is absolutely essential for the patient to give himself up to complete rest in bed and a milk diet. Many patients either refuse or only carry out the treatment in parts and the result is disaster. Begin treatment by a moderate dose of Castor Oil to free the bowel of its fermenting contents, and then give 8 pints of milk per day, not in regular feeds but in spoonfuls sipped at a time, the amount of milk is gradually increased as long as it can be digested without trouble, until 5 to 6 pints are being taken, at this stage the patient will steadily gain weight. Personally I am a strong believer in strawberries, if fresh strawberries are available so much the better, if not, begin with a reliable strawberry jam such as 'Tiptree brand,' with a teaspoonful three times daily gradually increasing up to 1 lb. daily. After six to eight weeks if the progress is satisfactory and the soreness of the mouth has entirely disappeared, liver soup should be added to the diet;

this is a most important addition, especially if there is a high degree of anæmia. Further additions in the diet may be ripe crushed bananas, fresh bael fruit, broth, then stale bread, rusks or toast. In the few cases which do not do well on a milk diet a complete change over to raw meat may be successful.

As regards drugs they are of little use in the treatment of Sprue, but Rogers recommends Bismuth Salicylate in 20 gr. doses up to three times daily after meals. The idea being that it passes with the food into the duodenum and acts as an intestinal disinfectant, in addition if two or more loose stools are being passed in the morning Pulv. Doveri gr. 10, is added to the evening dose to check the exhausting diarrhoea.

The mouth should be washed out with a mild mouth wash after each feed, at the beginning the tongue may be so sore that it will be necessary to paint it with a weak cocaine solution before the milk can be taken. The only other drug worth considering is Calcium Lactate gr. 15 t.d.s. after food with Parathyroid Extract 10 gr. twice daily as recommended by Scott. Good results in some cases have been reported by Rogers with an Autogenous Streptococcal vaccine from an oral culture, the dose being small, 25 to 50 M.

If the anæmia is profound it should be treated by liver soup, or one transfusion of blood gives better and more lasting results than in pernicious anæmia. Arsenic must never be given by the mouth, but in some cases can be given in small doses intravenously or intramuscularly.

STAMMERING

Onset in adult life is rare, it generally begins in children between five and six years, it is of importance in the initial stages to insist on slow and deliberate speech with firm vocal tone. If correction is carried out on these lines nervous stammerers will not develop. In the developed case it is necessary to discover which part of the mechanism of speech is at fault, to discover this the patient should read aloud with an uncovered chest, and it will be found that it is either necessary to increase the vital capacity of the lungs by breathing exercises, or to control expiration, or that the chest is not being kept full of air during speech. Re-educational exercises and not psycho-analysis is required in these cases.

STERILITY

This must be considered in (1) The male, (2) The female.

THE MALE—May be due to (a) Failure to achieve coitus, this is considered under Impotence; (b) Absence of secondary

sexual secretions from the prostate and the vesiculæ; (c) Absence of spermatozoa or diminution in number. (b) and (c) may be due to a variety of causes such as prostatitis, vesiculitis, epididymitis, ill health, especially from any septic foci, defective diet, retained testis, toxemia such as lead and alcohol.

THE FEMALE.—This may be due to (a) definite defective lesions such as imperforate hymen, septa and contraction of the vagina, conical cervix and pin hole of, and mal-developments of the uterus; (b) Infections of the Cervical canal, uterus and Fallopian tubes; (c) Prolapse, retroversion and tumours; (d) Cases in which no defect can be found: Incomplete coitus, painful and excessive coitus, vaginismus, obesity and absence of ovarian function, and excessive acidity of vaginal secretion.

In the consideration of these cases it should be remembered that more than one factor is commonly at work and that in many there is an impairment of fertility in both the man and the woman; it is important that the general health of both should be raised to the highest standard. In the male apart from this little can usually be done in the way of treatment, but in the women dilatation of the cervix and insufflation of the tubes with CO₂ or the injection of lipiodol may be tried, and finally there remains artificial insemination.

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STIMULANTS

R Tr. Aurantii	3ij	R Spt. Ætheris Nit.	m 80
Spt. Ætheris	3ss	Spt. Amm. Aromat.	m 80
Spt. Amm. Aromat.	3ss	Spt. Armoracis Co.	m 80
Tr. Nux Vom.	m 10	Aqua Camph. ad.	3j
Aqua Chloroformi ad.	3j	t.d.s.	
This is a powerful diffusible stimulant, which would not be recognized as alcohol.		Diffusible stimulant.	

℞ Liq. Ext. Kolæ	ʒss	℞ Liq. Ext. Cocœ Miscible	ʒss
Ext. Carui	gr. 10	Elixir Cinchonæ ad.	ʒss
Ext. Malti	ʒj	Stimulant, in water, 3 or 4 times	
Vin. Cocœ ad.	ʒj	daily.	
Three or four times daily. Nutritive and stimulant.			

STINGS AND BITES OF INSECTS

MOSQUITO AND SAND-FLY BITES.—Menthol, in the crystalline form, or Menthol Camphor, or Ammonia Solution, is useful to neutralize the strongly acid poison.

BEE, WASP OR HORNET STINGS.—Pot. Permanganate Solution 5 per cent., Spirit of Ammonia and Pulv. Ipecac. made into a paste, will largely prevent local swelling and pain in bee-stings. Ichthyol, pure or mixed with Wool Fat, is also recommended.

CENTIPEDES AND POISONOUS SPIDERS.—Camphor, Potassium Permanganate, weak solution of Phenol, Rum or Lime-juice. In severe Spider Bites, rest, stimulants, especially hot coffee, and the local injection of Pot. Permang. Solution 5 per cent.

PROPHYLAXIS FOR INSECT BITES.—Washing with strong Carbolic Soap. Emulsion of Kerosene or Petroleum, Oil of Citronella and Camphor in Alcohol, Phenol 1 oz. to a bucketful of water dabbed on the exposed parts without wiping.

TREATMENT OF SCORPION BITE.—Inject subcutaneously close to the sting 5 to 10 m of a 5 per cent. solution of Cocaine or Eucaine; in children and infants, 1 to 5 m. Or the application of a proximal ligature, and excision of the wound and treatment with Pot. Permang., as for snake-bite.

Also washing with a weak solution of Ammonia or the application of a paste of Ipecacuanha.

TO PREVENT MOSQUITO BITE.—(Used in the U.S.A. Army). One dram of Citronella Oil, mixed with two ounces of Vaseline, and applied to the exposed parts.

Lotion

℞ Neutral Quin. Sulph.	...	...	ʒi
Alcohol (95 per cent.)	...	...	ʒiv
Water	...	...	ʒiss

To be applied to the exposed parts of the body.

Ointment		Oil	
R Korosone Oil	℥j	R Aniseed Oil	m 3
Cocconut Oil	℥j	Eucalyptus Oil	m 3
Citronella Oil	℥j	Turpentine	m 3
Rub lightly on the exposed parts.		Boric Ointment	℥j
		Especially useful against sand-flies; to be rubbed on the exposed parts.	

STOMACH, CARCINOMA OF

Treatment is unquestionably surgical and every case of chronic indigestion over the age of thirty-five, which is not cured by rest in bed and a careful diet, should at once be subjected to examination of the feces for occult blood, X-ray examination after an opaque meal and gastric analysis. As an early diagnosis is all-important, followed by complete removal of the growth, as by this means alone can a cure be hoped for, the results of deep X-ray therapy are not encouraging and the intra-gastric use of radium is under trial.

STOMACH, DILATATION OF ACUTE POST-OPERATIVE—See After-treatment of Abdominal Operations.

STOMATITIS

This is seen in association with carious and septic teeth, abuse of alcohol and tobacco, in underfed children, and as a complication of acute infections. As a rule, attention to the underlying cause, cleanliness of the teeth and prescribing an alkaline and antiseptic mouth-wash is generally sufficient.

R Sod. Bicarb.	gr. 20	or R Pot. Chlorate	gr. 8
Boracic	℥j	Boracic	gr. 6
Glycerine	℥ij	Tr. Myrrho	m 10
Aquam ad.	℥iv	Aquam ad.	℥j

These prescriptions to be used with equal parts of warm water.

Potassium Chlorate is generally more useful when actual ulceration is present and it may be irritating to inflamed surfaces, and then is best combined with Opium.

R Pot. Chlorate	℥ij	R Pot. Chlorate	gr. 80
Borax	℥ij	Liq. Ext. Opii	℥ij
Sanitas.	℥ij	Aqua Laurocerasi	℥j
Aquam ad.	℥i℥	Decoct. Hordei ad.	℥vii℥

(Burney Yeo.)

Also the light application of Silver Nitrate stick, but it is important that the application be of the lightest, otherwise the condition will be aggravated.

APHTHOUS STOMATITIS.—There is general gastro-intestinal upset and indifferent health. After Magnesia in children and Calomel and a Saline in adults, give Chlorate of Potash locally and also internally by the following mixtures, No. 1 for adults and No. 2 for children:—

No. 1		No. 2	
R Pot. Chlorate	ʒiv	R Tr. Cinchona Co.	m 10
Tr. Ferri Perchlor.	ʒiv	Pot. Chlor.	gr. 2
Glycerine	ʒj	Acid Nitro-Hydrochlor. Dil.	m 2
Aqua Dest. ad.	ʒxij	Glycerine	m 5
		Aqua Cami ad.	ʒj
A tablespoonful every 4 hours.		A teaspoonful t.d.s. for a child of two years.	
(B. Smith and Feiling.)			

THRUSH.—This condition is produced by the fungus *Oidium Albicans* which causes large whitish patches and is probably due to lack of care with feeding bottles; it is very contagious. The white patches should be wiped away with cotton wool soaked in Sulphite of Soda ʒj to ʒj and following applied:—

<i>Internally</i>			
R Sodii Benzoati	ʒiij	R Sod. Bicarb.	gr. 1
Sodii Bicarb.	gr. 100	Hydrarg. cum Creta	gr. 1
Aqua Rosa ad.	ʒx	Bismuth Carb.	gr. 3
(Burnoy Yeo.)		Every 4 hours.	

MERCURIAL STOMATITIS.—This is now rarely seen. The mouth should be frequently irrigated and Pot. Iodide given.

GANGRENOUS STOMATITIS (CANCRUM ORIS).—The treatment must be immediate and energetic, if there is to be any hope of saving the child's life. The cheek is slit from the angle of the mouth to the masseter border, all sloughs and necrotic tissue cut away and the area swabbed with pure Carbolic which is allowed to act for 7 minutes and then removed with Carbolic lotion. Should the child live, a plastic operation will have to be performed for the deformity.

STONE—*See* Calculus.

STRANGULATED HERNIA—*See* Hernia.

STRICTURE OF THE URETHRA

Three kinds are described: Congestive, Spasmodic and Organic. The first two generally co-exist, and are usually relieved by a hot bath and warm enema; if these fail, catheterism will be necessary. Organic is the result of cicatricial tissue, and is classified for treatment as follows:—

PASSABLE

- | By Dilatation. | By Operation. |
|--|---|
| <p>(1) <i>Gradual</i>.—Should always be employed, if an instrument can be easily passed.</p> <p>(2) <i>Rapid</i>.—By Lister's instruments, if time is important.</p> <p>(3) <i>Continuous</i>.—May be employed, if only a very small catheter can be introduced with difficulty.</p> | <p>(1) <i>Excision</i>.—As this restores the urethra to the normal, it is the best operation, but is more successful in the deep than in the penile urethra.</p> <p>(2) <i>Internal Urethrotomy</i>.—Is useful in irritable, resistant, or old dense strictures, and in order to save time, but must not be used in impassable stricture.</p> <p>(3) <i>External Urethrotomy or Syme's Operation</i>.—Principally employed when there are complications behind the stricture, as extravasation of urine, perineal fistula or abscess.</p> |

Most strictures are amenable to dilatation. The possible complications of dilatation are (1) False passage, (2) Infection, (3) Syncope, which can be avoided by careful instrumentation, effective sterilization, and having the patient recumbent when the instruments are passed. Cases unsuitable for dilatation are (1) Impassable stricture, (2) Renal Complications, (3) Bladder Complications, such as stone, enlarged prostate, malignant disease and tuberculosis, (4) Urethral Complications, such as fistula, extravasation of urine, stone and periurethral abscess.

During dilatation, especially with frequency of micturition, the following mixture should be given:—

R Tr. Belladonna	...	...	m 7½
Urotropine	...	...	gr. 7½
Sod. Benzoate	...	...	gr. 15
Aqua Gaultheria ad.	...	...	℥j

t.d.s., between meals, in water.

IMPASSABLE

- | Retention of Urine.—Perineal Section or Cock's operation. | No Retention of Urine.—If the stricture still remains impassable after rest in bed and purgation, Wheelhouse's operation should be performed. |
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STYE

Is inflammation of a ciliary follicle, epilation of the lash and application of Ung. Hydrarg. Oxide Flav. 4 grs. to ʒj will frequently cut short the inflammation; should pus form, incise and apply hot boric fomentations. If recurring, vaccines are advisable and examination of the eye for any error of refraction.

SUBACUTE COMBINED DEGENERATION—*See*
Recent Advances in Medicine.

SUB-PHRENIC ABSCESS

This dangerous condition generally shows the following signs at any time from 2 weeks to 2 months after a septic abdominal lesion, generally an appendix. Continuous fever, increased pulse rate and malaise, with rapid deterioration of health, without obvious cause and without pain. An X-ray should be taken. Early evacuation of the pus with free drainage is essential and the high mortality is due to the condition being so often overlooked.

SUBINVOLUTION OF THE UTERUS

The following treatment is recommended:—

Hot vaginal douches, Tr. Iodi ʒj to ʒij	If a tendency to Anaemia, give—	
Of twice daily.	℞ Liq. Ext. Ergotæ	m 20
Ichthyol plugs 10 per cent.	Tr. Ferri Perchlor.	m 15
Internally, Ergot and Hydrastin.	Elixir Aurantii	ʒss
Flabby soft uterus with low tension pulse, an injection of Pituitary Ext. once or twice weekly.	Aqua Dest. ad.	ʒss
	In half a wineglass of water, t.d.s., after food.	

SUFFOCATION—*See* Drowned, Treatment of the Apparently.

SUNSTROKE—*See* Heat Stroke.

SUPPRESSION OF URINE

It may occur as the termination of an incurable disease, such as cancer of the bladder or the uterus; in black-water fever it

is due to the blocking of the tubules with hæmoglobin; and if complete, nothing can be done in any of these conditions. Anuria may also be due to a calculus, post-operative after operations on the urinary tract, more especially after dilatation of a urethral stricture or the passage of a catheter for enlarged prostate. There are also the conditions of infective anuria and hysterical anuria.

Prophylaxis of this very serious complication may be summed up in the careful avoidance of traumatism and chills, asopsis and the administration of urinary antiseptics during the treatment of stricture, etc.

Treatment is directed to re-establishing the urinary flow and removing toxic bodies from the circulation. The bowels are freely opened after washing out the rectum with large saline enemata. Turpentine stupes or a mustard leaf is applied to the kidneys, the skin is made to act and stimulants given freely. Should these measures fail, two pints of a 2½ per cent. Glucose solution should be given intravenously, this is the most powerful diuretic. One of the following may be tried in addition to the above treatment:—

R Pot. Citrate	gr. 10	or R Caffem Sodio-Benzate	gr. 5
Sp. Aetheris Nit.	m 80	Amm. Benzoate	gr. 8
Inf. Buchu ad.	℥j	Spt. Chloroformi	m 10
		Inf. Uva Ursi. ad.	℥j
R Diuretin	gr. 15	Every 8 hours.	
In sealed gelatin capsules, every 4 hours.			

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SYCOSIS

Commence treatment with a dose of Calomel and Saline; give tonics—Iron, Mineral Acids, Strychnine, Bitters.

Stage of Suppuration.—Remove all scabs and crusts by oil dressings, boric fomentation, or by a Boric Acid wet dressing, changed 5 times in the 24 hours.

In the succeeding stage of dermatitis use—

R Calomel	...	...	...	gr. 15
Zinc Oxide	...	...	...	gr. 45
Petrolatum	...	...	...	3i

If this is insufficient then use—

R Salicylic Acid	...	...	...	gr. 7½
Resorcin	...	...	...	gr. 15
Oil of Cade	...	...	...	m 75
Zinc Oxide	...	...	...	3iss
Petrolatum	...	...	...	3j

No attempt should be made to regrow the hair until a year after all signs of the disease have disappeared.

SYNCOPE—See Cardiac Disease, Heart Failure.

SYNOVITIS, TRAUMATIC

Rest, evaporating lotions and elastic pressure, weight bearing should be avoided until effusion has disappeared. If the amount of fluid is large aspirate, if the effusion tends to become chronic a combination of pressure, splinting and counter-irritation, the latter by means of Scott's dressing which to be effective must be reapplied every third day.

SYPHILIS—See Special Article on Venereal Diseases.

SYPHILIS, CONGENITAL—See Congenital Syphilis.

SYPHILIS OF THE NERVOUS SYSTEM—See Tabes Dorsalis, Disseminated Sclerosis.

SYPHILITIC ULCERATION OF THE LARYNX—See Diseases of the Throat.

TABES DORSALIS

All cases should be given the benefit of anti-syphilitic treatment rigorously pushed; the patient should be allowed to continue his usual vocation if possible, but over-exertion is certainly harmful. Special symptoms require treatment such as the pains, for these bromides or iodides regularly; for the bouts of pain analgesics will be required of which Aspirin is one of the best, but in large doses, 20 to 30 gr. If there are repeated bouts of severe pain, Salvarsanized serum should be injected intrathecally; in exceptional cases the pain may call for chordotomy, i.e. division of the antero-lateral tracts of the cord. Of the

crises—Gastric is the most common; chloroform may be tried, but Morphia is the only remedy that is certain of giving relief. Laryngeal crises are relieved by amyl nitrite or a few whiffs of chloroform. The bladder always requires careful attention. Ataxia should be treated by re-educational exercises. Patients should be warned not to cut corns, as perforating ulcers may result.

TACHYCARDIA—*See Cardiac Disease.*

TAPE WORMS—*See Worms, Intestinal.*

TEETH, CARIES OF—*See Special Article on Dental Surgery.*

TEETH, EXTRACTION OF—*See Special Article on Dental Surgery.*

TENDONS, DIVIDED—*See Divided Tendons.*

TENO-SYNOVITIS

Absolute rest if possible; if not, firm bandaging over cotton wool. Friction with stimulating liniments is useful, but hot and cold applications are not effective. As soon as the signs of inflammation have gone, massage and a complete range of movements to prevent adhesions should be given. Internally Sodium Salicylate should be pushed except in gonorrhoeal cases when Iodides should be given.

TESTICLE, IMPERFECTLY DESCENDED

Treatment is essentially operative and may be imperative on account of the following complications: (1) Torsion of the cord and gangrene; (2) Recurrent attacks of orchitis from slight injuries; (3) The presence of a hernia. The undescended testicle is usually devoid of spermatogenic function, but probably produces its internal secretion. It is certainly more liable than the normally placed testis to malignant disease. The possible methods of treatment are: Transplantation of the testicle into the scrotum and castration.

TETANUS

It has now been clearly shown that the tetanus toxin is absorbed by the end plates of motor nerves, whence it extends up the nerves themselves to become fixed in the cells of the cord and brain.

The MEMORANDUM ON TETANUS, issued by the British War Office Committee, is the best guide for treatment of that disease, embodying as it does all the experience of the War. The following are the important points:—

- (1) The prophylactic value of injections of Antitoxic Serum is beyond all question, but there is strong experimental evidence that in about ten days the immunity conferred by the primary injection is lost to a great extent; and whereas many cases of Tetanus have occurred not only in men with healed wounds, but also in those whose wounds were from the beginning practically clean, and in men suffering from trench foot, sometimes without obvious breach of surface, it has been decided that all wounded men shall receive at least four injections of Tetanus Antitoxin, that is to say, a primary injection given at the time of the wound, and three other subcutaneous injections at intervals of a week. The dose of the four injections should be of 500 units each. It can be definitely stated that the danger of anaphylactic shock is negligible when 500 units contained in 3 cm. of Horse Serum are given subcutaneously, whatever the interval after the preceding injection.
- (2) Precautions to be taken before operating on wounds: When operations are performed at the site of wounds, even if they are healed, a prophylactic dose of 500 units should be invariably given if the operation be performed at a greater interval than seven days from the last injection. This precaution is very necessary as numerous cases have occurred in which the performance of a simple operation has been followed by an attack of Tetanus, although in many cases the primary wound had been healed several weeks before the operation.
- (3) Antiseptics which are of use in the preventive treatment of Tetanus are the group of oxidizing agents, such as Hydrogen Peroxide, Potassium Permanganate, Chlorine Water, Dakin's Solution and Solution of Iodine, are particularly unfavourable to the anaerobic growth of the Tetanus bacillus. They have the power of rendering toxin nontoxic.
- (4) Delayed Tetanus has been frequently seen; in one case the disease did not develop until 72 days after the wound had been received, and 42 days after the wound had completely healed; the case was fatal.

- (5) Localized Tetanus is a distinct and not infrequent type, to be carefully watched for, and the signal for immediate and energetic treatment, to prevent a generalized attack.
- (6) Early diagnosis is of the greatest importance. All clinical and experimental evidence tends to show that the chances of successful treatment diminish rapidly, as the length of time increases, after the first symptoms have been observed. A delay of an hour may make all the difference between success and failure.

TREATMENT.—

PROPHYLACTIC.—In India, in all wounds which are in any way contaminated with soil, the patient should receive anti-toxin, and this especially applies to polo accidents, the dose being 500 units.

***ANTITOXIN.**—It is of the greatest importance that treatment be commenced immediately the diagnosis is made. The following scheme for acute cases is recommended by Bruce:—

Day		Subcutaneous. Units	Intramuscular. Units	Intrathecal, Units
1st	...	....	8,000	16,000
2nd	...	.....	8,000	16,000
3rd	...	.....	4,000	8,000
4th	...	....	4,000	8,000
5th	...	2,000	.....	....
7th	...	2,000	.....	.....
9th	...	2,000	.....	.....

The point in giving antitoxin, both intrathecally and intramuscularly, is that the rapid elimination of the former is counterbalanced by the more gradual absorption of the latter.

SYMPTOMATIC.—Either Morphia $\frac{1}{4}$ gr. should be given every 4 hours, or the spasms should be controlled by chloroform inhalation, with full doses of Chloral and Bromide. The patient is fed by nutrient enemata.

Carbolic Acid has no curative effect or action upon the course of the disease; it is not recommended.

Magnesium Sulphate has no effect upon the disease itself; the cessation of spasm which follows an injection is only tem-

porary, and is purchased at the cost of risks which are far from negligible.

Surgical treatment of the wound after Tetanus has appeared: It appears safer to abstain from surgical interference with the wound, until the ordinary treatment for Tetanus has been carried out. *See also Tetanus under Specific Therapy and Recent Advances in Medicine.*

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TETANY IN CHILDREN

Commonly seen in conjunction with rickets, convulsions and laryngismus stridulus and requires the appropriate treatment of sunlight, diet and cod liver oil, and for immediate treatment Calcium Chloride 5 gr. for a child of a year, as the condition is probably due to deficient calcium in the nervous system.

THREADWORMS—*See Worms, Intestinal.*

THRUSH—*See Stomatitis.*

THYROID DISEASE—*See Goitre.*

TIC DOULOUREUX—*See Neuralgia.*

TINEA CRURIS—*See Dhobie Itch.*

TINEA FAYOSA (FAYUS)

The first indication is the removal of crusts; this is best done by saturation with oil for 24 hours, Oil of Ergot being the best.

The skin being thus clear, the following antiparasitics are applied:—

R Ung. Hydrarg. Oleatis
Adipis

3iv R Cupri Oleatis
3iv Adipis

3ss
3j

A little of the first ointment is well rubbed in with the fingertips, and after a few days used alternately, with the second, every day or two, for 4 or 5 weeks.

TINEA FLAVA

Treatment is difficult; it disappears in a cold climate, to re-appear in hot weather.

R Resorcin	3j	R Chrysarobin Ointment 2 per cent.
Acid Salicylic	gr. 10	
Vaseline	3j	R Tr. Iodi on covered parts of the body.

The treatment must be continued for several months.

TINNITUS

This may be referred to the head generally or to one or both ears, and may accompany any type of deafness, including that occurring in anæmia, renal and cardiac disease and that due to the administration of Sodium Salicylate and Quinine. *See* Special Article on Diseases of the Ear.

TOE NAIL, INGROWING

If the case is seen before ulceration has begun, cut the nail square; this with cleanliness and general attention to the feet may cure the condition. Otherwise Sir Watson Cheyne's Operation is recommended; under general anæsthesia a flap is cut from the outer side of the toe by entering the knife beyond the granulations and cutting to the extremity. The nail is now split from the free edge to the base by scissors, rather less than half of the affected side being removed, the corresponding portion of the matrix being removed back to its farthest point. If any portion of this matrix is left, the operation will be a failure. The flap is now united by sutures to the raw area from which the nail was removed.

TONGUE, DISEASES OF

TONGUE TIE.—It is extremely rare for the condition to persist as development of the tuberculum impar continues during infancy, therefore division is seldom necessary. On the other hand tongue swallowing results from extreme length and looseness of the frænum.

WOUNDS OF THE TONGUE.—Are usually from the teeth, hæmorrhage is not severe except in some deep punctured wounds. Temporary arrest can then be made by hooking forward the whole

tongue with the finger thus putting the lingual arteries on the stretch.

ACUTE GLOSSITIS.—Is due to either staphylococci or streptococci infection. The swelling may extend to two or three times the normal size. Two longitudinal incisions, half an inch deep, in the dorsum cause immediate relief and usually rapid clearing up.

INFLAMMATORY DISEASE, CHRONIC.—The following is Butlin's classification:—

- | | |
|-----------------------------|-----------------|
| 1. Erythema Migrans. | 5. Herpos. |
| 2. Dyspeptic Tongue. | 6. Leucoplakia. |
| 3. Furrows and Wrinkles. | 7. Tuberculous. |
| 4. Glossodynia Exfoliativa. | |

Speaking generally the treatment of these conditions is cleanliness of the mouth and the use of a Chlorate of Potash mouth-wash, and the avoidance of all sources of irritation. Radium is not beneficial in cases of Leucoplakia and Butlin is adverse to interference unless definite warty conditions are present. A paint of Chromic Acid 1 to 2 gr. to the ounce and ointments are useful applications to the tongue. The following are recommended by Butlin:—

R Glycer. Acidi Carb.	m 30	R Ung. Acidi Borici No. 2	℥ss
Spirits Chloroformi	3ij	Cocainæ Hydrochlor.	gr. 3
Tr. Myrrh.	3ij	Hydrous Lanoline	℥ss
Eau de Cologne ad.	℥iv	To be gently rubbed into the tongue	
Two teaspoonfuls in 4 oz. warm		at bed-time.	
water,			

ULCERS OF THE TONGUE.—These are merely a further stage of the above conditions. Butlin's classification is:—

- | | |
|-------------------------|----------------------|
| 1. Simple. | 6. Mercurial Ulcers. |
| 2. Dyspeptic. | 7. Tuberculous. |
| 3. Herpetic. | 8. Syphilitic. |
| 4. Traumatic. | 9. Malignant. |
| 5. Ulcer of the Frænum. | |

The tongue may be attacked by syphilis in any of the three stages. Butlin's warning must be repeated: 'Nothing leads to greater errors in diagnosis and treatment than to see syphilis in every form of obscure affection of the tongue, or to persist in the diagnosis of syphilis when a short and vigorous administration of antisyphilitic remedies has proved of no service.'

CARCINOMA OF THE TONGUE.—Treatment of this condition has undergone revision partly as a result of the introduc-

tion of diathermy and partly of radium therapy. All that can be said at present is that radium in certain types of cancer of the tongue gives as lasting results and is considerably less dangerous and mutilating than the radical measure of excision. The use of diathermy, either by the diathermy knife for excision or by the button for slowly cooking the growth, has lessened the dangers of operation. As regards the cervical lymphatic glands these must either be removed by block dissection or treated with the radium collar. While radium may ultimately prove the better treatment, at present it is wiser to excise the glands on one or both sides according to the position of the growth, irrespective as to what treatment is used for the tongue.

TONSILLITIS, ACUTE—*See Diseases of the Throat.*

TONSILLITIS, CHRONIC—*See Diseases of the Throat.*

TORTICOLLIS, CONGENITAL

This may be due to hæmatoma ischæmic contraction of the lower two-thirds of the sterno-mastoid in the newly born, malposition in utero, or very rarely syphilitic infiltration. Manipulation will cure up to six months, otherwise operation is required, the muscle being divided by the open method.

TRACHEA, FOREIGN BODIES IN—*See Air Passages and Oesophagus, Foreign Bodies in.*

TRACHOMA OR GRANULAR LIDS—*See Diseases of the Eye.*

TRANSFUSION—*See Minor Operations.*

TRICHIASIS OR ENTROPION—*See Diseases of the Eye.*

TRIGEMINAL NEURALGIA—*See Neuralgia.*

TUBERCULOSIS, SURGICAL—*See Tubercular Disease of Bones, also Joints.*

TUBERCULOSIS OF THE LARYNX—*See Diseases of the Throat.*

TYPHOID—*See Enteric.*

TYPHUS

Mogaw has classified the Typhus group of Fevers into four classes:—

- I. Louse Typhus: Typhus Fever; II. Tick Typhus: Rocky Mountain Fever; III. Mite Typhus: Japanese River Fever; IV. Typhus of Unknown or Uncertain Vector.

These are all closely related to one another, of which the virus is probably Rickettsia bodies. In typhus, which is a self-limited disease usually of about twelve days' duration, the peculiar rash appears on the third to the fifth day. There is no specific treatment, and treatment is carried out on the same principles as for Enteric. But nurses must be protected by louse-proof clothing which is frequently sterilized.

ULCER, CORNEAL—*See Diseases of the Eye.*

ULCER, DUODENAL—*See Gastric and Duodenal Ulcer.*

ULCER, GASTRIC—*See Gastric and Duodenal Ulcer.*

ULCER OF TONGUE—*See Tongue, Diseases of.*

ULCERS

Simple ulcers which may be defined as not due to any specific micro-organism such as syphilis, tubercle, tropical ulcer or to neoplasms, have been divided into the following groups:—

1. **INFLAMED ULCER**.—These are old dirty neglected ulcers. The leg should be raised and borie or carbolic fomentations applied.
2. **CALLOUS ULCERS**.—Scrape away the overthickened edges and incise the tissues deeply an inch from the edge to allow contraction. Then rest and elevate and give Calcium Iodide gr. 8, t.i.d.
3. **IRRITABLE ULCER**.—Exposed nerve filaments in the base. Locate the tender points with a probe and divide nerve fibres a short distance from the ulcer, then treat as above.
4. **ANÆMIC ULCER**.—Seen in women in bad health. Give iron internally and a stimulating dressing, such as Lotion Rubra or Friar's Balsam.

5. **VARICOSE ULCER.**—The best treatment is a bandage of Elastoplast applied over the entire limb including the ulcer without dressing; at first it is changed weekly then fortnightly. For hæmorrhage elevate the limb and apply an antiseptic dressing. The question of treatment of the veins by injection should be considered.
6. **PERFORATING ULCER.**—This starts from a suppurating bursa beneath a corn or callosity usually in cases of *tabes dorsalis*. The ulcer should be rendered healthy by fomentations or scraping and then plugged with gauze soaked in Friar's balsam, the patient giving complete rest to that foot.
7. **PIGMENTÆNIC ULCER.**—Seen usually in diabetics. Clean with hydrogen peroxide, cut away all sloughs and then treat with strong carbolic. The treatment should be that for cellulitis; there may be severe constitutional symptoms.

UNDULANT FEVER—*See* Malta Fever.

URÆMIA

Treatment should be carried out under the following heads.—

1. **PURGATION.**—This should be done freely with \mathcal{R} Pulv. Jalapæ Co. gr. 7 or \mathcal{R} Mag. Sulph. ʒij every 2 hours for three doses.
2. **DIAPHORESIS.**—This is of little use in acute cases.
3. **BLEEDING.**—Remove 12 to 15 oz. and then give intravenous Sod. Bicarb. 4 per cent. This is especially useful if there is uræmic asthma, combine it with Sod. Bicarb. ʒj by mouth every two hours until dyspnoea is relieved.
4. **LUMBAR PUNCTURE.**—Of special value for convulsions, coma, drowsiness and severe headache.
5. **CHLOROFORM INHALATIONS** will control the convulsions, but there is no reason why Morphia, gr. $\frac{1}{4}$, should not be given, the only contra-indication being uræmic asthma.
6. **CALCIUM CHLORIDE** can be given for twitchings and convulsions. 1 gr. in 40 m of water is given intramuscularly every hour for 4 doses.

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URETER, CALCULUS OF—*See* Calculus.

URETHRA, RUPTURE OF

In a case of ruptured urethra following a blow or fall on the perineum, there is pain and a desire, but inability to pass urine, with hemorrhage from the meatus. The patient must be prevented from making any attempt at micturition. A gum elastic catheter with stilet is passed gently along the roof of the urethra; if it enters the bladder the urine is drawn off and it is tied in. If it does not pass it is left in position, and the patient is placed in the lithotomy position, the hæmatoma incised the clot turned out, and hemorrhage stopped by hot irrigation. If only partly ruptured, the edges are trimmed and sutured with catgut over a catheter. If completely ruptured the visceral end may be difficult to find, then suprapubic cystotomy may have to be performed and the end identified by retrograde catheterization.

URETHRAL CARUNCLE

The only effective way is to remove a small part of the posterior wall of the urethra by a wedge-shaped incision, thus removing the whole base; the wound is closed with one or two catgut sutures. Some prefer diathermy in which case great care must be taken not to burn round the meatus.

URETHRAL STRICTURE—*See* Stricture of the Urethra.

URETHRITIS—*See* Venereal Disease—the Special Article on Gonorrhœa.

URIC ACID GRAVEL—*See* Gravel.

URINE, RETENTION OF

The first point to decide is whether the case is one of anuria or retention due to obstruction or atony of the bladder wall.

1. The retention may be due to Gonorrhoea—if possible relieve without passing a catheter. Seat the patient in a hot sitz-bath, give a large hot saline enema and then a suppository of Ext. Belladonna gr. $\frac{1}{4}$ with Aqueous Ext. Opii gr. $\frac{1}{2}$. Then if relief is not obtained, a catheter must be passed for which an anæsthetic will probably be necessary.

2. If due to stricture, commence catheterization with a No. 6. French olivary and work down the scale to the smallest size. This failing, the bladder must be either aspirated, or drained by the suprapubic route, or external urethrotomy performed by Wheelhouse's operation; the advantage of the latter is that a radical cure is made of the stricture.

3. Obstruction by stone or foreign bodies, tight phimosis, blood clot, etc. An endeavour should be made to remove stone or foreign bodies through a slit meatus with urethral forceps, or to push back into the bladder. Filling of the bladder from sudden hæmorrhage from a growth will require suprapubic cystotomy and washing out of the clots followed by drainage.

4. Enlarged Prostate.—If a soft catheter fails then give a hot bath and try a large coude or bicoude; if this fails then try a large silver prostatic catheter. Catheterization failing, the bladder should be drained suprapubic until prostatectomy can be performed.

5. The distended atonic bladder of spinal disease, especially Tabes Dorsalis and Disseminated Sclerosis. If in these cases the urine is regularly drawn off, the bladder will recover tone especially if ergot is given.

6. Retention from reflex spasm especially after operations about the rectum and anus and in hysteria.

7. Retroversion of the gravid uterus and fibroids.

In all these cases it is essential to observe the strictest asepsis, great gentleness in manipulation and to withdraw the urine gradually.

URINE, SUPPRESSION OF—See Suppression of Urine.

URTICARIA

First, if possible, discover the cause. It may be due to:—

1. EXTERNAL IRRITANTS, such as hair lotion and parasites.

2. GASTRO-INTESTINAL IRRITANTS.—Almost any article may be the cause in those who have an idiosyncrasy. The common are fish, especially shell-fish, eggs, acid wines and fruit, especially strawberries.

B A GOUTY CONSTITUTION.

R Phenazone	gr. 6	R Ung. Acid Salicylic.	
Liq. Arsenicalis	m 2		
Aquam ad.	ʒij	R Phenolia	gr. 8
		Petrolati	3v
		(For the itching.)	

Chronic Cases

Arsenic internally.

R Ext. Belladonna	gr. $\frac{1}{8}$ to $\frac{1}{4}$	R Beta-naphthol	gr. 16
t.d.s.		Zinc Oxide	ʒj
		Ung. Simplex	ʒj
R Strontium Salicylate	gr. 5	Calcium Chloride or Calcium Lactate	
In capsule.		10 to 15 gr. t.d.s.	

Children

Liq. Picis Carbon ʒj, added to a warm bath before going to bed, is an excellent remedy.

UTERINE HÆMORRHAGE—See Menorrhagia, Metorrhagia and Obstetrics.

UTERUS DISPLACEMENT

The same importance is not attached to these conditions as has been done in the past and treatment is only carried out if they are giving definite symptoms.

1. ANTEFLXION AND ANTEVERSION.—This is the normal position of the virgin uterus. Unless complicated by adhesions, it is a rare condition.

2. RETROFLEXION AND RETROVERSION.—This is a very common condition and often of no importance. If causing backache worse during the periods, pain on defecation and dyspareunia, then replace bimanually and put in a Hodge's pessary. If the fundus is fixed or the condition recurs after the pessary has been worn for some time, operation must be considered.

3. PROLAPSE OF THE UTERUS AND VAGINAL WALLS.—Treatment largely depends on the degree of prolapse. Cystocele in the minor form should be treated with astringent douches or a ring pessary. Pessaries are not satisfactory in the treatment of rectocele, and it is advisable to do posterior col-

perhaps with advancement of the perineum. In complete prolapse of the uterus the only treatment is either a cup and stem pessary or operation.

UTERUS, FIBROIDS OF—*See* Fibroids of the Uterus.

VACCINATION AND REVACCINATION—*See* Special Article.

VACCINATION ERUPTIONS

(Morris)

GROUP I.—*Eruptions due to Pure Vaccine Inoculation.*

GROUP II.—*Eruptions due to Mixed Infection (Vaccine with an Additional Virus).*

GROUP I

ERUPTIONS DUE TO PURE VACCINE INOCULATION

DIVISION A.—*Secondary local inoculation of vaccine.*

DIVISION B.—*Eruptions following within first three days, before development of Vesicles: (a) Urticaria; (b) Erythema Multiforme; (c) Vesicular Eruptions.*

DIVISION C.—*Eruptions following after development of Vesicles, due to the absorption of Virus:—*

1. Roseola—like Measles; Erythema—like Scarlet Fever; Lichen; Purpura.
2. Generalized Vaccinia.

DIVISION D.—*Eruptions appearing as sequelæ of Vaccination: (a) Eczema; (b) Psoriasis; (c) Urticaria.*

GROUP II

ERUPTIONS DUE TO MIXED INOCULATION

DIVISION A.—*Introduced at time of Vaccination:—*

- (a) Producing local skin disease: (1) Contagious Impetigo; (2) Erythema.
- (b) Producing constitutional diseases: (1) Syphilis; (2) Leprosy; (3) Tuberculosis.

DIVISION B.—*Introduced, not at the time of Vaccination, but subsequently through the Wound:—*

- (1) Erysipelas, (2) Cellulitis; (3) Furunculosis; (4) Gangrene; (5) Pyæmia.

VACCINE THERAPY—*See Specific Therapy.*

VAGINISMUS

In many cases there is a neurotic element which must be treated. Locally it will generally be found that the hymen has never been satisfactorily stretched or torn, or that there are some sensitive tags which require dissecting off or that the sphincter vaginae requires division posteriorly with a transverse union of the wound to render the vagina larger.

VARICELLA—*See Chicken-pox.*

VARICOCELE

The treatment is either palliative by injection or by operation. Palliative consists in wearing a suspender of which the best is Keetley's. Injection treatment is still *sub judice*, but successes have been reported in the anterior type with Sod. Salicylate. Operation should only be done in large varicocoles which cause pain and discomfort. The veins are exposed just below the external abdominal ring, the anterior group of veins are isolated and an inch is removed, the ends being looped up to each other. The posterior group of veins are not touched.

VARICOSE ULCER—*See Ulcers.*

VARICOSE VEINS

Treatment by ligature and excision of the internal saphenous is now never carried out. The injection method aims at obliteration of the veins by the injection of sclerosing substances, such as Sodium Salicylate in solution of 20 to 40% or Quinine and Urethane, Sodium Chloride, Glucose or Sodium Morrhuate. Because the method is so simple and satisfactory, it should not be employed without due consideration to the needs of each individual patient and without proper precautions. It is contraindicated in cardiac and renal diseases, diabetes, pregnancy, where there is deep femoral thrombosis or phlebitis of the superficial veins. It should be performed for the relief of pain and aching discomfort, to improve the appearance of the legs, to prevent the veins getting worse in some cases of varicose ulceration and to enable a candidate to enter the public services.

One advantage is that the patient need not lie up, but can pursue his normal activities. Details of the technique require full and careful consideration, and for these a book on General Surgery or a special treatise like Douthwaite's should be consulted.

PALLIATIVE TREATMENT.—Prolonged standing should be avoided, also constipation and restriction by garters, etc. The patient should rest with the limb elevated; support may be given by elastic stockings or light weight bandages applied from the foot upwards before getting out of bed.

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VARIOLA—See Smallpox.

VENESECTON—See Minor Operations.

VERTIGO

May be due to a large variety of causes including toxic, such as alcohol, tobacco, toxæmia; the aura of an epileptic fit, arterio-sclerosis, anaemia, nephritis, migraine, etc. But in the great majority of cases severe vertigo is of labyrinthine origin and examination should be made of the ears. It may be due to a plug of wax or require inflation of the Eustachian tubes. But should it occur in acute otitis media, paracentesis of the drum should be performed, and in chronic otitis media it is an indication for immediate operation. If there is arterio-sclerosis, a combination of Pot. Bromide and Pot. Iodide should be given, with a positive Wassermann antisypilitic treatment should be pushed. Care must be taken not to overlook a serious lesion such as cerebellar tumour.

The outlook in Menière's disease is uncertain: complete recovery may take place, or with impaired hearing, or total deafness. Salicylates should be given in 20 grain doses t.d.s., and Bromides sometimes have a marked effect. See also article—Recent Advances in Medicine.

Vertigo with Tinnitus

R Quinine Sulph.	gr. 2 to 5	R Auri Tribromidi	gr. 1/60
Acid Hydrobrom. Dil.	ʒi	Kaolin	gr. 1
Spt. Chloroform	m 10	Ung. Paraffini	q.s.
Aqua Menth. Pip. ad.	ʒi		for one pill.
Every 6 hours.		One pill every 3 hours.	

Vertigo of Arterio-Sclerosis

R Liq. Ext. Ergot	m 10
Pot. Bromide	gr. 10
Syrup Aurantii	ʒss
Aqua Menth. Pip. ad.	ʒi
Every 4 hours.	

Vertigo in Platonic Cases

R Pil. Hydrag.	gr. 3
Pil. Rhei Co.	gr. 3
Ext. Hyos.	gr. 1½
One pill occasionally at bed-time.	

VINCENT'S ANGINA—*See* Diseases of the Throat.**VOMITING**

The causes of vomiting are:—

1. LESIONS OF THE BRAIN AND ITS MEMBRANES.—Meningitis, Tumour, Abscess.
2. DISEASES OF THE STOMACH.—Carcinoma, Gastritis, Dilatation.
3. DISEASES OF THE LIVER.
4. DISEASES OF THE PERITONEUM AND INTESTINES.—Int. Obstruction, Peritonitis.
5. REFLEX.—Pregnancy, Sea-sickness, Ménière's disease.
6. TOXIC.—Poisoning, Uræmia, Cholera, Yellow fever.
7. ONSET OF ACUTE INFECTIOUS DISEASES.—Smallpox, Pneumonia, etc.
8. COLIC.—Renal, Hepatic, Lead.
9. NERVOUS.—Disgust, Fear, Migraine, etc.

TREATMENT.—Remove the cause. If toxic, completely emptying the stomach, with the stomach tube, gives relief.

Vomiting of Pregnancy

R Cerii Oxalatis	gr. 3	R Cerii Oxalatis	gr. 4
Coccosoli	m ½	Bismuth Salicylate	gr. 5
Strychnine	gr. 1/60	Cocaine Hydrochlor.	gr. ½
One pill every 8 hours.		One cachet every 4 hours.	

℞ Cerii Oxalate	gr. 2	℞ Cocaine Hydrochlor.	gr. $\frac{1}{2}$
Creosoli	m 1	Sod. Bromide	gr. 8
Cocaine Hydrochlor.	gr. $\frac{1}{2}$	Aqua Dest. ad.	℥ss
One pill on rising, another later if necessary.		Every half-hour for 3 or 4 days.	

Enema for the Vomiting of Pregnancy

℞ Sod. Brom.	...	...	...	℥ss
Chloral Hydras	...	...	...	℥ss
Milk and Water ad.	...	...	...	℥iv

Vomiting following the Prolonged Administration of an anæsthetic

Enema containing Pot. Bromide 40 gr.

Morning Vomiting of Drunkards

Arsenic is very efficacious.

Sea-sickness, for treatment of—See p. 216.

The following prescriptions have proved useful in vomiting due to varying causes:—

℞ Acid Hydrocyanic Dil.	m 4	℞ Cocaine	gr. 2
Pot. Bicarb.	gr. 20	Antipyrin	gr. 16
Sp. Amm. Aromat.	m 15	Aqua ad.	℥ij
Liq. Bismuthi	m 80		℥j every hour.
Aqua Chloroformi ad.	℥j		
t.d.s. with a dessertspoonful of lemon juice white effervescing.			
℞ Tr. Iodi	m 1	℞ Vin. Ipecac	m 2
Glycerina	℥ss	Aqua Dest. ad.	℥ss
Aqua Dest. ad.	℥j		Every hour.
Every hour.			
		℞ Menthol	gr. $\frac{1}{2}$
		Syrup	℥j
		Aqua Dest. ad.	℥ss
			t.d.s.

VULVO-VAGINITIS

This may be either (1) Simple or (2) Gonorrhœal.

The disease as it occurs in young girls is very obstinate and requires prolonged treatment. A bacteriological examination should be made in the first place to determine the nature of the infection. In the simple form the surrounding skin should be protected by White Precipitate Ointment 5 gr. to ℥j and gauze soaked in 1 in 4,000 Perchloride of Mercury solution kept in contact with the vulva. In the gonorrhœal form the treatment must be more energetic, the Perchloride of Mercury solution should be 1 in 2,000; and a compress of 1 per cent. Protargol may be applied for five minutes four times daily. A stock vaccine should also be used; the condition is highly contagious and every

precaution must be taken to avoid infection especially of the eyes.

WARTS

There are two varieties: the common wart and the juvenile flat wart. They are probably infective, and it has recently been claimed that they can be cured by suggestion. Large single warts are most quickly removed by excision, but if on the face or scalp better cosmetic results are obtained by electrolysis. They can also be treated by diathermy and carbon dioxide snow. If the warts are too numerous for these methods radiotherapy may be cautiously tried.

An ointment of Acid Salicylic or Resorcin 10 per cent. is efficient but slow.

R Acid Salicyl.	...	...	gr. 10
Ext. Cannab. Indic.	...	...	gr. 1
Collod. Flex.	...	...	3j

Paint twice daily. (*Ward.*)

Internally Hydrarg. Iodidum Viride gr. $\frac{1}{4}$ t.i.d.s. for adults and smaller doses in proportion for children is effective.

WASTING IN INFANCY—*See* Marasmus.

WHITLOW

This is an acute inflammatory condition of a finger usually going on to suppuration. There are four kinds:—

1. Ungual whitlow or onychia.
2. Subcuticular, often affecting the pulp of a finger tip.
3. Acute Suppurative Teno-Synovitis or Thecal Whitlow.
This may be by extension from the subcutaneous tissues from the periosteum or by direct injury.
4. Phalangeal whitlow; as the result of extension from one of the other varieties a phalanx, usually a terminal one, becomes necrosed.

* TREATMENT.—This is important and unless carefully carried out the result may be a stiff and useless finger that has to be amputated. Under a general anæsthetic, a careful and deliberate incision should be made to allow free drainage, but carefully avoiding the flexor tendon, hot boric fomentations should then be applied.

WHOOPIING COUGH

Opinion is divided as to the benefit of vaccine treatment both as a prophylactic and curative agent. Ephedrine in doses of 1/12 to 1/8 gr. may be given in conjunction with Belladonna and Vinum Ipecac.; the latter has been recently advocated. The following prescriptions can be recommended:—

R Phenazoni	gr. 1	or R Pot. Bromide	gr. 8
Sodii Bromidi	gr. 8	Tr. Belladonna	m 8
Syrup Amentii	m 8	Amm. Carb.	gr. 1/2
Aqua Chloroformi ad.	3j	Syrup Tolu.	m 8
		Aqua Chloroformi ad.	3j
Every 6 hours.		Every 6 hours.	

WORMS, INTESTINAL**ROUND WORMS.—**

R Santonin	...	...	gr. 5
Castor Oil	...	...	3ss
Mucilage Acacia	...	...	3iv
Syrup	...	...	3j
Aqua Menth. Pip. ad.	...	...	3j

For an adult.

TAPE WORMS.—Careful preparation of the patient is essential, otherwise the treatment is very unsatisfactory.

(1) The patient is kept in bed for 3 days on a pint of milk daily, with the following mixture:—

R Sod. Bicarb.	...	...	gr. 20
Sod. Sulph.	...	...	3j
Sp. Chloroform	...	...	m 20
Aqua Menth. Pip. ad.	...	...	3j
	t.d.s.		

(2) R Mag. Sulph.	...	...	3ss
Tr. Jalapæ	...	...	3j
Tr. Chloroform Co.	...	...	m 20
Aqua ad.	...	...	3j

To be given the third night and early morning of the next day.

(3) R Liq. Ext. Male Fern.	...	...	3j
Mucilage Tragacanth.	...	...	3j
Syrup Ginger	...	...	3j
Chloroform Water ad.	...	...	3j

At 8 a.m. and again at 9 a.m. on the fourth morning.

(4) At 11 a.m. on the fourth morning, a Seidlitz powder followed at 12 noon by a soap and water enema if the bowels have not previously acted.

Special care must be taken to see that the head of the worm is expelled.

THREAD WORMS.—

DRUG TREATMENT.—(1) Petroleum Emulsion (B.P.C.), 3j t.i.d.s.

(2) Hunyadi or other aperient Sulphate water daily.

(3) Sulphur lozenges, 9 gr. daily.

(4) Oil of male fern, given in the same way as for tape worms.

LOCAL TREATMENT.—(1) Enema of Infusion of Quassia, stronger than B.P., 1 in 40.

(2) Enema of salt and water, 1 tablespoonful to half-pint of water, or combined with Inf. Quassia.

(3) Suppository ʒ gr. Santonin every second night for 3 times.

(4) Ung. Hydrarg., a small piece inserted into the rectum every night. (R. Hutchison.)

IN CHILDREN.—

TAPE WORM.—Following a full dose of Calomel, give Male Fern 15 gr., in capsule, every quarter of an hour for four doses.

<i>Round Worms</i>		<i>Thread Worms (Enemas)</i>	
℞ Santonin	gr. ʒ	℞ Oleum Terebinthinæ	3ij
Calomel	gr. ʒ	Santonin	gr. 2
Sugar	q.s.	Starch Mucilage	ʒvi
Give one such dose, for every year of child's age, every night, for 3 or 4 nights.		Give slowly through a funnel.	
		℞ Infus. Quassia or Common Salt	3j to Oj
		Give warm and quite slowly through a funnel.	

WOUNDS

A. WOUNDS CAUSED BY ANIMALS.—

BEAR.—These wounds may be very extensive from the animal's claws, but are comparatively clean and heal well.

CAMEL.—Has a terrible bite and kick. By the bite the soft parts and bones are extensively crushed and lacerated.

JACKAL.—Generally attacks children and is frequently infected with hydrophobia.

LEOPARD AND TIGER.—These wounds are always grossly infected, from the particles of putrid meat, which the animal has adhering to his claws and teeth, and unless very active measures can be taken without delay, generally prove fatal.

TREATMENT.—1. The patient must first be treated for SHOCK (*see* above), which is especially severe in these cases. As soon as he has sufficiently recovered—

2. The surgeon decides as to whether primary amputation is necessary (*see* The Question of Amputation above) or whether the wound can be treated conservatively. If the latter is decided upon—

3. Under anæsthesia, hæmorrhage is completely stopped, and the wound temporarily packed with gauze wrung out of Dakin's solution or Carbolic 1 in 20, and covered with a small gauze pad.

4. The skin is shaved, cleansed with turpentine, washed with etheral soap solution and finally with alcoholic solution of Biniodide of Mercury.

5. The pad and gauze are then removed from the wound, which is enlarged so as to open up all the deeper parts; any pieces of clothing or particles of dirt are removed.

6. The muscles are carefully examined, and cut away until healthy bleeding tissue, which reacts quickly to stimulus, is reached.

7. The lacerated and bruised margins of the wound are excised, and any other devitalized tissue.

8. The Carrel-Dakin treatment is then carried out, but the practitioner should not be deterred from using this most efficient treatment, by the fact that he has not the standard equipment, as with a little ingenuity an apparatus, capable of carrying out the essentials of the treatment, can be easily rigged up.

B. WOUNDS OTHER THAN THOSE CAUSED BY ANIMALS.—There is nothing special in the treatment of these wounds in the tropics, except that anti-tetanic serum should be given and this applies particularly to polo accidents.

TREATMENT OF INFECTED WOUNDS.—This is of special interest in India, where heavily infected wounds from wild animals and other sources are so common.

1. One method is dependent on the antiseptic property of Hypochlorite solution, which is used to irrigate every part of the wound and chemically sterilize it, and is known as the Carrel-Dakin treatment, Carrel having introduced the irrigation apparatus, and Dakin the solution (0.45 to 0.5 per cent. solution of Sodium Hypochloride; for preparation, *see infra*).

The Dakin solution does not damage the phagocytes nor interferes with the repair of the tissues, at the same time preventing the growth of bacteria.

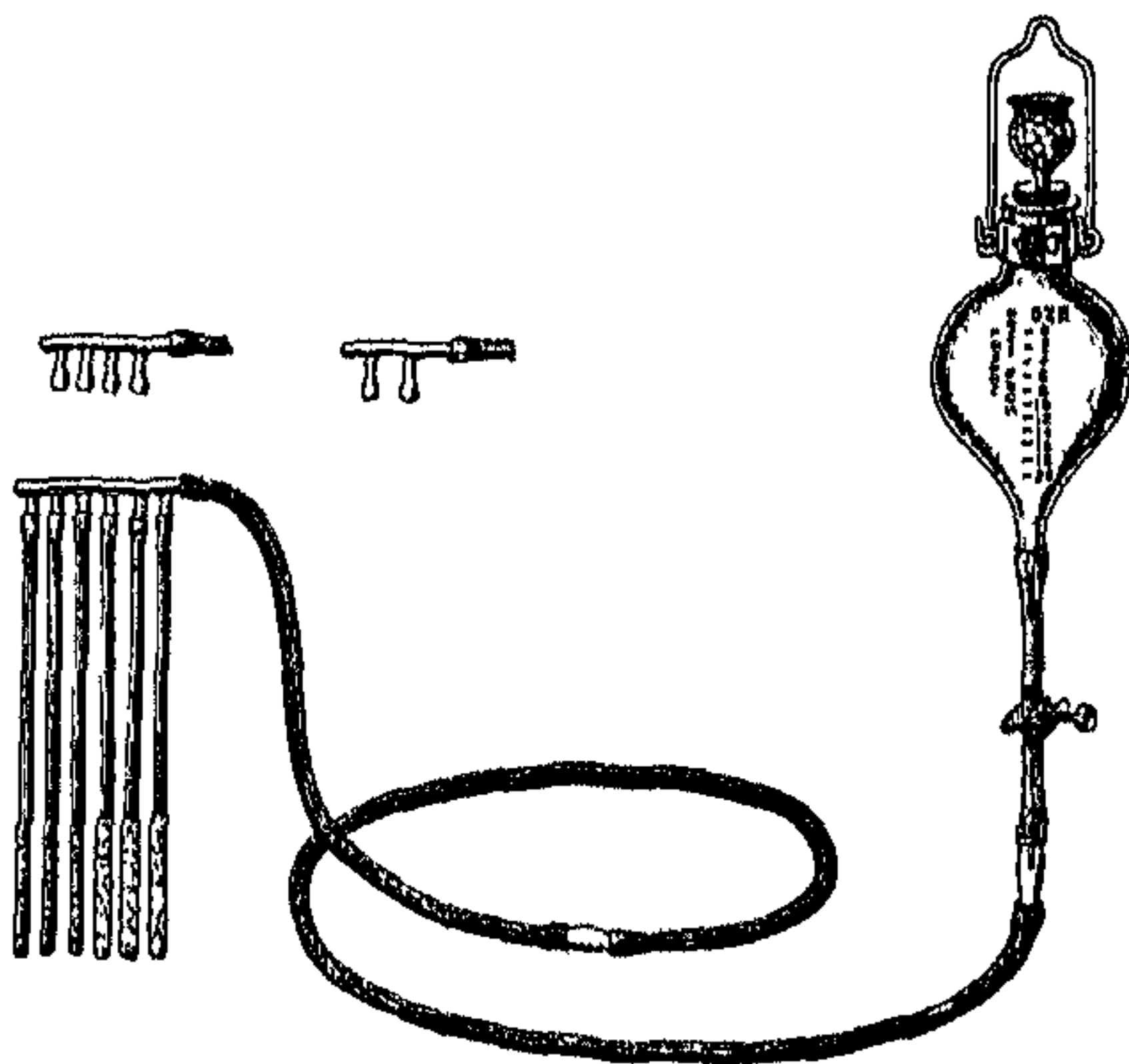
The wound must be freely opened up, and all dead, damaged or doubtful tissue cut away. Dependent drainage is not necessary nor advisable. In fact, the ideal wound is one with sloping sides, forming a basin, which always retains the solution.

The method is not continuous irrigation, but 40 c.c. of the solution are released from the reservoir every two hours and allowed to flow into the wound by gravity.

On reference to the illustration, it will be seen that the apparatus is supplied with one-, two-, three-, four-, or six-branch distributing tubes. These tubes are closed at the distal end, and are perforated with a special punch forceps to the distance required for each case. They are 4 m.m. in diameter.

The tubes are placed in the wound so as to reach the entire depth and irrigate every pocket, being kept in position by packing gauze soaked in Dakin's solution.

Carrel's apparatus for the sterilization of infected wounds by the Dakin-Daufresne solution



[Messrs. Down Bros. have kindly lent electro for this illustration]

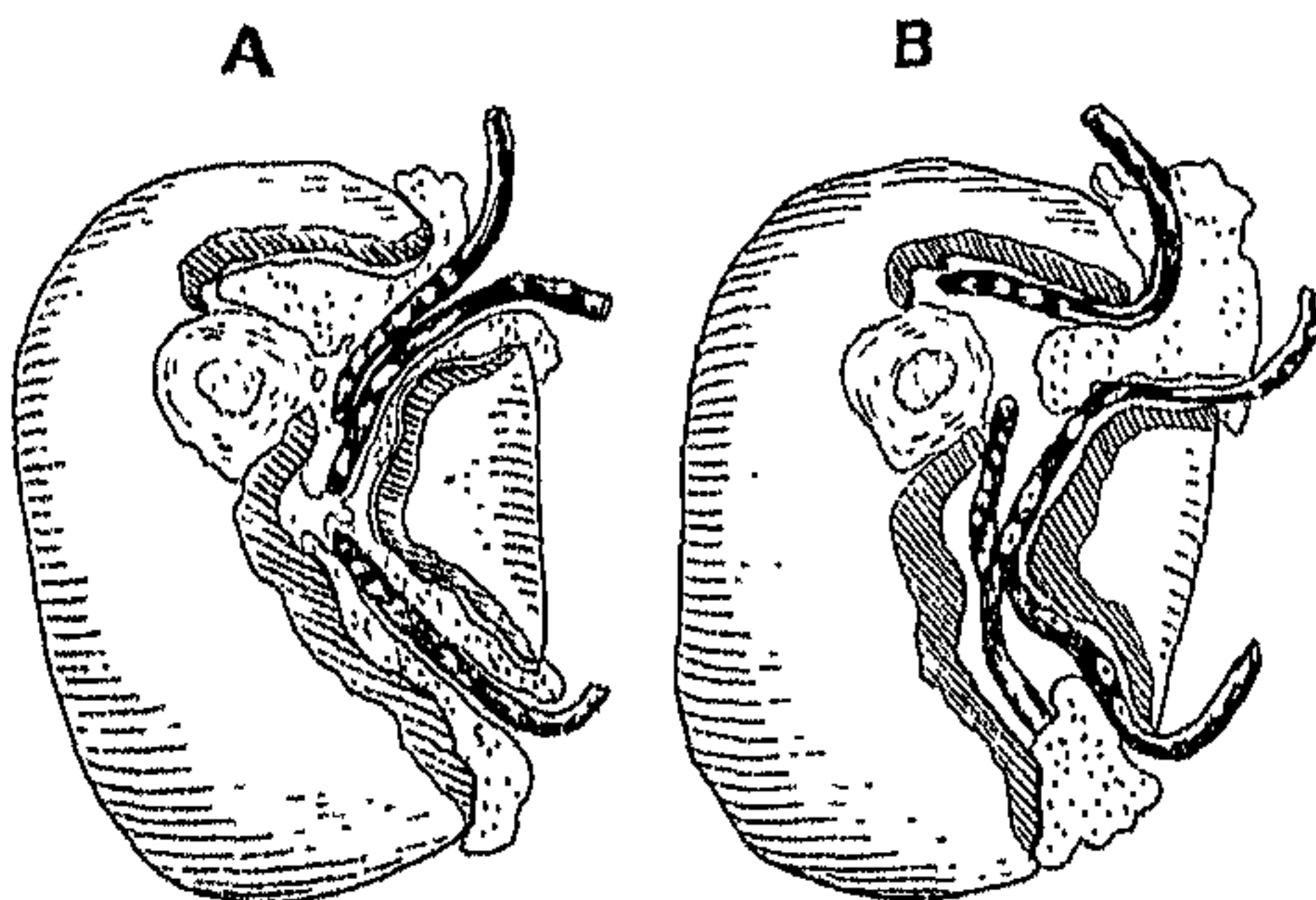
CARRIÉL'S APPARATUS FOR INSTILLATION, with 20-oz. graduated Reservoir, one each of one-, two-, three-, four- and six-branch distributing Tubes with India-rubber tubing, and Punch Forceps for perforating rubber tubes, complete.

N.B.—The Drop Indicator (A) is only used for drop by drop instillation in connection with a single distributing tube. When using the multiple distributing tubes for intermittent instillation, the Indicator is replaced in the circuit by the simple glass union, which is supplied with the apparatus.

The correct and incorrect methods of packing are shown in the following illustration.

The tubes pass from the wound between layers of gauze soaked in Dakin's solution, through a pad of non-absorbent sterilized wool, to the glass connecting tube.

The skin around the wound must be protected by layers of gauze infiltrated with sterile vaseline, as the solution is irritating; more especially if free alkali is present.



(Carrel and Dehelly.)

- A. The wrong way of placing the distributing tubes, the tubes being in contact with the gauze instead of in direct contact with the wound.
- B. The right way of placing the distributing tubes, so that Dakin's Solution comes directly in contact with all surfaces of the wound, the gauze lightly plugging the openings in order to retain the solution in the cavity of the wound.

Smears of the discharge are taken from day to day and the bacterial content noted, the number rapidly diminishing

until in from ten days to a fortnight the wound can be looked out as clinically sterile. At this stage, either secondary suture can be carried out, or if this is not considered advisable, the following Chloramine Ointment should be applied:—

R Chloramine T.	...	...	...	10 parts
Stearate Soda	...	...	...	80 parts
Water	...	...	...	4 parts

This treatment is most efficient, if carefully carried out in every detail, but it requires constant attention of a skilled nurse or assistant.

2. THE TREATMENT WITH SALT SOLUTION RECOMMENDED BY SIR ALMROTH WRIGHT.—The essentials are, first, the application of a Hypertonic salt solution 5 to 10 per cent. This acts in several ways, but principally by improving the vascular supply of the tissues; by removing the lymph block, it causes the leucocytes which it comes in contact with to swell up and burst, liberating trypsin, which gradually digests sloughs. It also checks leucocyte emigration, thus reducing the amount of pus. After a time this action ceases, and the Hypertonic solution must then be changed to Isotonic solution 0·85, which promotes phagocytosis.

It is important that the whole wound is opened up and the saline solution allowed to come in contact with every part. Otherwise, it will not be successful. The solution can be irrigated into the wound by the Carrol irrigator, or if the wound is superficial, applied by several layers of gauze soaked in the solution and frequently changed.

3. BIPP TREATMENT.—A third method is by a paste:—

R Bismuth Carbonate	...	...	...	3j
Iodoform	...	...	...	3ij
Liquid Paraffin	...	...	...	3iij

Care must be taken that the constituents are sterile and the Paraffin pure. The Bismuth and Paraffin are sterilized by dry heat at 120°C. for half an hour. The Iodoform by washing in 1 in 20 Carbolic solution.

Treatment is carried out as follows:—

1. The wound is freely opened up.
2. The removal of all highly infected and damaged tissues.
3. Mechanical cleaning of the wound with dry sterile gauze swabs.

4. Hemorrhage is completely controlled.
5. The wound is dried with alcohol or ether.
6. The paste is then applied on swabs to the whole surface of the wound, and gently rubbed in, more especially into the muscles, in such a way that a thin film covers the entire surface; but particles must not be left in the wound; as, otherwise, toxæmia may result from the Bismuth. The total amount should not, as a rule, exceed one drachm.
7. Two applications are generally sufficient at an interval of 6 days.
8. The wound is left open and packed with gauze; in rare cases, it may be feasible to employ primary suture.

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X-RAY THERAPEUTICS—See Section II—Therapeutic Measures.

YAWS

A chronic disease closely resembling syphilis both in its course and causal organism (*Spironeura Pertenuis*). Salvarsan and allied arsenic organic preparations are rapidly curative. Novarsenobillon is generally used in doses of 0.6 to 0.9 gm. intravenously for children and 0.1 gm. for very small children.

YELLOW FEVER

Is not seen in India, but its close relationship to Dengue and Sand-fly make it of interest, and there is always the danger of it being introduced into India from the Far East.

ADDITIONAL PRESCRIPTIONS

ABDOMINAL TUBERCULOSIS

℞ Oleum Morrhue	℥ 40	When the stools are loose and offen-
Iodoform	gr. $\frac{1}{2}$	sive.
Tr. Lavandulæ Co.	℥ 6	
Mucilage	q.s.	℞ Hydrarg. cum Creta
Aqua Menth. Pip. ad.	℥j	Sod. Bicarb.
t.d.s.p.o.		gr. 1 to 2 gr. 4

ACNE VULGARIS

Sulphur is the most important drug in treatment.

℞ Sulphuris Præcipitata	...	...	gr. 35
Spiritus Camphoris	...	...	℥ 30
Aquam Calcis ad.	...	...	℥j

ACIDOSIS

To lessen the occurrence of Acidosis
after an Anæsthetic in children.

Acidosis in Asthma

Examine the urine for Diacetic Acid.

℞ Pot. Bicarb.	gr. 12	It is more frequent in children.
Sod. Bicarb.	gr. 12	
Cal. Carb.	gr. 6	Give Glucose with :—
Mag. Carb.	gr. 6	℞ Sod. Bicarb.
Aquam ad.	℥j	Pot. Cit.
		℥j ℥ss

ADENOIDS

If for any reason an operation cannot be performed.

℞ Resorcin	...	...	gr. 5 to 10
Tr. Hamamelis	...	...	℥ 30
Normal Saline ad.	...	...	℥j

Instil 5 or 6 drops into the nose with the child lying on its back.

ALBUMINURIA CYCLICAL IN CHILDREN

℞ Amm. Bromide	...	...	gr. 4
Pot. Bromide	...	...	gr. 4
Liq. Arsenicalis	...	...	℥ 2
Sodii Hypophosphitis	...	...	gr. 3
Aquam Chloroformi	...	...	℥ss
Aquam Menth. Pip.	...	...	℥ss

Two to four teaspoonsful t.d.s. (H. C. Cameron.)

ANOREXIA

℞ Tr. Nux Vom.	℥ 7	℞ Sod. Bicarb.	gr. 15
Tr. Cinchonæ	℥ 30	Tr. Nux Vom.	℥ 7
Tr. Calumba	℥ 30	Tr. Gentian	℥ss
Tr. Gentian	℥j	Aqua Chloroformi ad.	℥j

In water before meals.

A dose before each meal.

ARTERIO-SCLEROSIS AND HIGH BLOOD PRESSURE

R Pot. Iodide	gr. 12	R Tr. Valerianae Viridis	m 15
Liq. Arsenicalis	m 4	Tr. Cardamon Co.	℥ss
Tr. Nux Vom.	m 6	Aqua Chloroformi ad.	℥ss
Aqua Menth. Pip. ad.	℥ss	t.d.s.p.c.	
t.d.s.p.c.			

ASTHMA

During the attack

R Liq. Ext. Grindelia	m 20	R Liq. Ext. Grindelia	m 20
Pot. Iodide	gr. 2	Tr. Belladonna	m 7
Trinitrin	gr. 1/200	Sod. Bromide	gr. 12
Tr. Euphorb. Pilulif.	m 20	Mucilage Acacia	q.s.
Aquam ad.	℥ss	Aqua Chloroformi ad.	℥j

A dose every 2 hours until relieved.

A dose every 2 hours until relieved.

To prevent attacks

R Tr. Stramonium	m 5	R Pot. Iodide	gr. 5
Tr. Belladonna	m 5	Pot. Bicarb.	gr. 10
Pot. Iodide	gr. 2	Tr. Belladonna	m 5
Tr. Lobelia Æth.	m 3	Syrup Auranti	℥j
Syrup Tolu.	℥ss	Inf. Gentian Co.	℥j
Aquam ad.	℥ss		

Each prescription an ounce t.d.s.p.c.

BRONCHITIS ACUTE

Diaphoretic in early stages

R Liq. Amm. Acet.	℥ss
Tr. Ipecac.	m 5
Sp. Æth. Nit.	m 20
Tr. Camph. Co.	m 15
Aqua Chloroformi ad.	℥j

Every 3 hours with water.

Expectorant for the later stages

R Amm. Carb.	gr. 5
Tr. Ipecac.	m 10
Tr. Scilla	m 15
Tr. Chlorof et Morph. Co.	m 10
Syrup Tolu.	m 80
Aqua Chloroformi ad.	℥ss

Every 3 hours in water.

BRONCHITIS CHRONIC

R Vinum Ipecac.	m 7	R Syrup Scilla	℥ss
Amm. Chloride	gr. 12	Syrup Tolu.	℥ss
Mist. Ammoniaci	℥j	Inf. Senega ad.	℥ss
Syrup Tolu.	℥j	t.d.s. in water.	
Aqua Anisi ad.	℥j		

t.d.s.

R Tr. Benzoin Co.	℥ss	R Oleum Cubeba	m 2
Vinum Ipecac.	m 8	Tr. Senega	m 15
Syrup Pruni Virg.	℥ss	Terebenti	m 8
Mucilag. Acacia	℥ss	Mist. Amygdal. ad.	℥ss
Aqua Anisi ad.	℥j	In water every 4 hours.	

In water t.d.s.

CATARRHAL JAUNDICE

Neglected Catarrhal Jaundice in which the jaundice has lingered for some months.

R Hydrarg. cum Creta 1 gr.
Pulv. Cretæ 1 or 2 gr. Fiat pilula. t.d.s.

Continue until the gums are touched and keep so for a month. (Murray.)

CONSTIPATION

R Oleum Ricini	3j	R Boro-Glycerite	m 7
Sod. Bicarb.	gr. 10	Agar Jelly	gr. 45
Mucilage Acacia	3j	Sodium Benzoate	gr. 1
Syrup	3j	Phenolphthalein	gr. 8
Aqua Cinnamon ad.	3j	Glycerine	m 25
For the constant use of patients with		Liq. Paraffin	m 75
Hæmorrhoids.		P. Acacia	gr. 2½
		P. Tragacanth.	gr. 1
		Aqua Dest. ad.	3ss

R Sulphur Præcip.	gr. 5	R Sodii Hypophosph.	gr. 5
Confection Senna	3jss	Cal. Hypophosph.	gr. 5
Pulvis Carbonis Salicis	gr. 5	Liq. Paraffin	3j
At bed-time.		Pulv. Acacia	3j
		Syrup Auranti	3j
		Aqua Dest. ad.	3j

R Sodii Sulphatis	3j	R Liq. Ext. Cascara Sagrad	3vi
Mag. Sulphatis	3j	Ext. Liquorice Liq.	3iiss
Syrup Zingiberis	3j	Tr. Carminativæ	m 80
Aquam ad.	3j	Syrupus ad.	3iv

A good morning Saline.

One to four drachms at bed-time.
(Tindal.)

R Ext. Euonymi Sicc.	gr. 1	R Mannæ	3j
Pulv. Ipecac.	gr. ½	Syrup Sennæ	3j
Ext. Hyos.	gr. 1	Syrup Tamarindi Co.	3j
* Ext. Aloes	gr. 1½	Aqua Anethi ad.	3j

A good laxative for young children,
a teaspoonful or more according
to age.

COUGH

R Liq. Picis Aromat.	m 20	R Tr. Camph. Co.	m 20
Syrup Pruni Virg.	3ss	Oxymel Scillæ	m 20
Syrup Codeine	3ss	Spt. Chloroformi	m 10
Inf. Cascariillæ ad.	3ss	Inf. Cascariillæ ad.	3j
t.d.s.		Every four hours.	

Lincts

R Diamorphin. Hydrochl.	gr. ½	R Vinum Ipecac.	m 5
Terpin Hydras.	gr. 3	Diamorp. Hydrochlor.	gr. ½
Tr. Pruni Virg.	m 20	Syrup Tolu.	m 15
Glycerine	3ss	Syrup Pruni Virg.	m 15
Aqua Dest. ad.	3ss	Aqua Dest. ad.	3j

A tablespoonful whenever the cough
is troublesome.

A teaspoonful whenever the cough
is troublesome.

R Oxymel Scilla	℥ij	R Heroin Hydrochlor.	gr. 1/12
Tr. Camph. Co.	℥ij	Syrup Pruni Virg.	℥j
Syrup Tolu.	℥ij		
Glycerino	℥ij	A teaspoonful at a time.	

A teaspoonful for a dose.

CRACKED NIPPLES

The Lotion

R Glycerini	Acid Boric	...	...	℥iv
Liq. Ext. Hydrastis	...	...	...	℥iv
Mucil. Acacia	...	...	...	℥iv
Aqua Rosæ ad.	...	...	...	℥vii

Apply on lint.

DIARRHŒA

Diarrhœa after an aperient

R Tr. Kino	℥j
Tr. Catechu	℥j
Mist. Crocæ	℥iij
Aqua Cinnam ad.	℥vj

A tablespoonful every three hours.

Excessive peristalsis

R Barium Sulph.	gr. 10
Acid Sulph. Aromat.	℥ 10
Tr. Opii	℥ 8
Oleum Cinnam	℥ 1/2
Aquam ad.	℥ss

A tablespoonful every four hours
in water.

Lead Acetate is a powerful astringent

R Pil. Plumbi & Opii.	gr. 4	R Plumbi Acetatis	gr. 2
Oleo-Resin Zingiberis	gr. 1/2	Liq. Morph. Acet.	℥ 15
		Acid Acetici	℥ 20
		Aquam ad.	℥j

One pill twice daily.

t.d.s.

DUSTING POWDERS

Stimulating Antiseptic

R Calomel	℥j
Boric Acid	℥j
Bismuth Subnit.	℥j
R Boric Acid	℥j
Starch	℥iij
Zinc Oxide	℥ij

Foot-powder

R Boric Acid	℥iiss
Salicylic Acid	℥j
French Chalk	℥iv
R Tannic Acid	℥j
Borax	℥v
Morph. Hydrochlor.	℥j

ENEMATA

R Starch	gr. 120	R Chloral Hydrate	gr. 10 to 40
Aquam ad.	℥v	Starch Enema ad.	℥iv
R Purified Ox Bile	gr. 30	R Olive Oil	oz. 5
Soap Enema	oz. 20	Water	oz. 15
R Castor Oil	oz. 1	R Tr. Opii	℥ 30
Olive Oil	oz. 4	Mucilage of Starch	oz. 2
R Soft Soap	oz. 1	R Oil of Turpentine	oz. 1
Water	oz. 16	Mucilage of Starch	oz. 15

EYE-DROPS

For Conjunctivitis

R Novocain	gr. 4	R Cocaine Hydrochlor.	gr. $\frac{1}{2}$
Zinc Sulph.	gr. $\frac{1}{2}$	Boric Acid	gr. 10
Liq. Hydrarg. Perchlor.	m 15	Epinephrine Hydrochlor	ʒij (1 in 100)
Aqua Camph.	ʒij	Rose Water ad.	ʒj
Aqua Destillata ad.	ʒj		
R Acidi Tannici	gr. $\frac{1}{2}$	R Zinc Sulph.	gr. $\frac{1}{2}$
Zinc Sulph.	gr. $\frac{1}{2}$	Sod. Biborat.	gr. 3
Aqua Camph.	ʒij	Aqua Destill.	ʒj
Aqua Destillata	ʒvi		
R Acid Hydrocyan. Dil.	m 4	R Argyrol	gr. 30 to 90
Borax	gr. 4	Aqua Destillata	ʒj
Sod. Bicarb.	gr. 4		
Aquam ad.	ʒj		

For Refraction Cases

R Cocain Hydrochlor. ...	...	gr. 1
Homatropin Hydrobrom.	...	gr. 2
Aqua Destillata ...	...	ʒij

One drop is instilled every 7 minutes for 3 or 4 doses. The eye is ready for examination half an hour after the final dose.

Eye Ointments

R Hydrarg Ammoniat.	gr. 1	R Yellow Oxide of Mercury	1 to 2 per cent.
Adepsis	ʒij		

For Chronic Conjunctivitis, Pteryctenular and Interstitial Keratitis, Blepharitis and Opacities of the Cornea.

Exophthalmic Goitre (Grave's Disease)

R Acid Hydrobrom. Dil.	m 12	R Pot. Bromide	gr. 12
Quinine Hydrobrom.	gr. 6	Tr. Belladonna	m 8
Syrup Aurantii	ʒj	Liq. Arsenicæ	m 4
Aquam ad.	ʒj	Aqua Chloroformi ad.	ʒj

Each prescription, two tablespoonful t.d.s.p.c.

GARGLES

R Sod. Benzoate	ʒiss	R Acid Carbol.	gr. 60
Sod. Bromide	ʒiss	Sod. Biborat.	gr. 60
or Resorcin	ʒiss	Pot. Brom.	gr. 60
Phenazone	ʒiss	Sp. Menth. Pip.	ʒss
Sp. Menth. Pip.	m 80	Glycerine ad.	ʒiv
Glycerine	ʒiv		
A teaspoonful in $\frac{1}{2}$ glass of warm water.		A teaspoonful in $\frac{1}{2}$ tumbler of tepid water.	

The above are prescriptions by Sir St. Clair Thomson.

R Pot. Chlor.	gr. 12	R Loto Hydrarg. Nigra.	ʒj
Sod. Bicarb.	gr. 6	Pot. Chlorate	gr. 10
Pot. Bicarb.	gr. 6	Aquam ad.	ʒj
Aquam ad.	ʒj		

GASTRALGIA

Gastralgia and Vomiting

℞ Menthol gr. 2½
 Cocaine Hydrochlor. gr. 10
 Sp. Vini Rect. ʒiij
 Syrup ʒiiss
 One teaspoonful every one to two
 hours. (Burney Yeo.)

Hysterical Gastralgia

℞ Chloral Hydras. gr. 40
 Calcii Bromidi ʒiiss
 Codemone gr. 3
 Aqua Laureocerasi ʒiij
 Aquam ad. ʒvi
 A tablespoonful every 4 hours.
 (Burney Yeo.)

℞ Liq. Opii Sedativi ... m 5 to 8
 Sp. Amm. Aromat. ... m 30
 Aqua Carui. ad. ... ʒi
 A dose when pain is severe. (Burney Yeo.)

GASTRITIS CHRONIC

For Fermentation

℞ Creosoti m 1 ℞ Tr. Rhei Co. m 20
 Pulv. Rhei gr. 1½ Sod. Bicarb. gr. 12
 Pulv. Calumbæ gr. 1½ Tr. Zingiberis ʒss
 Pulv. Saponis gr. ½ Inf. Gentian Co. ad. ʒi
 The pill after food. (Burney Yeo.) t.d.s.p.c.

GASTRITIS CHRONIC IN CHILDREN

℞ Sod. Bicarb. gr. 2 ℞ Pulv. Rhei gr. 2 to 3
 Pulv. Rhei gr. 1 Hydrarg. cum Cloa gr. ¼ to 1
 Hydrarg. Subchlor. gr. 1/12 Every night for a week.
 Sacch. Alb. gr. 5 (Hutchinson.)

GLANDS

Acutely swollen Cervical Glands

℞ Pot. Iodide ... gr. 15
 Iodine ... gr. 12
 Glycerine ... ʒij
 Aquam ad. ... ʒi

Apply twice daily to the pharynx with a brush.

℞ Tr. Ferri Perchlor. m 5 to 8 ℞ Oleum Morrhuæ m 80
 Liq. Hydrarg. Perchlor. m 10 to 15 Creosoti m 1
 Liq. Sarsæ Co. ʒi For one capsule, two capsules
 Aqua Dest. ʒss twice daily.
 t.d.s. (Eustace Smith.)

HEPATIC DISTURBANCES

℞ Quoniamin gr. ½ ℞ Pil. Hydrarg. gr. 1
 Podophyllin gr. ¼ Pil. Rhei Co. gr. 1
 Iridin gr. ¼ Pil. Colocynth Co. gr. 1
 Oleum Menth. Pip. gr. ½ Ext. Ilyos. gr. 1

This is an excellent pill acting well
 on the liver without griping.

The pill to be taken at bed-time
 occasionally.

R Sod. Sulph.	3j	R Tr. Podophyllin	m 8
Acid Hydrochlor. Dil.	m 10	Sod. Phosphatis	gr. 80
Spirit Chloroformi	m 10	Sp. Amm. Aromat.	m 15
Aqua Menth. Pip.	3j	Aqua Chloroformi ad.	3j
To be taken in the early morning in a small tumbler of water.		t.d.s.	

INHALATIONS

R Tr. Benzoin Co.	m 60	R Tr. Benzoin Co.	3j
Menthol	gr. 8	Menthol	gr. 20
Oleum Eucalypti	m 8	Oleum Pini	m 80
A teaspoonful to a pint of water at 150°F., not boiling water.		Tr. Conii	m 80
		Two teaspoonsful to a pint of water at 150°F.	
R Glycerine Carbolic	3j	R Tr. Benzoin Co.	3ij
Sp. Camphoræ	3j	Chloroform	3ij
Tr. Benzoin Co.	3ij	R Tr. Benzoin Co.	3ij
Sp. Chloroformi	3ss		
½ to 1 teaspoonful to a jug of boiling water.		Menthol	gr. 40
		A teaspoonful of either of the above to a pint of water at 150°F.	

INFLUENZA

R Quinine Sulph.	gr. 1	R Sod. Salicylate	gr. 15
Sod. Salicylate	gr. 10	Quinine Amm.	m 30
Pot. Cit.	gr. 20	Glycerine	3ss
Syrup Aurantii	3ss	Sp. Amm. Aromat.	m 10
Aqua Chloroformi ad.	3j	Aquam ad.	3ss
Every 4 hours.		Every 4 hours in water.	

JOINTS

The following may be tried in all cases of doubtful joint trouble :—

R Sod. Iodide	gr. 5	R Pot. Iodide	gr. 12
Sod. Salicylate	gr. 15	Tr. Nux Vom.	m 7
Vin. Colchici Sem.	m 80	Liq. Arsenicalis	m 2
Syrup Sarsæ Co.	3iv	Liq. Sarsæ Co.	3iv
Aquam ad.	3j	Aqua Dest. ad.	3j
t.d.s. (Shaw's Mixture.)			

LINIMENTS

R Methyl Salicylate	20 parts	R Menthol	8 parts
Menthol	10 parts	Chloroform	4 parts
Chloroform	10 parts	Olive Oil	10 parts
Camphor	10 parts		
Eucalyptus Oil	10 parts	R Linimentum Capsici	
Turpentine Oil	10 parts	Painted on the skin or sprinkled on	
Belladonna Lin.	15 parts	flannel, it produces a red glow within	
Lavender Oil	5 parts	an hour. Its action can be arrested	
Liq. Paraffin to	100 parts	by smearing with Vaseline.	

(Martindale.)

Liniment Mentholis Co.

R Menthol	2 parts	R A.B.C. Liniment.	
Aconite Liniment	1 part	Equal parts of Liniments of Aconite,	
Chloroform	4 parts	Belladonna and Chloroform.	
Soap Liniment	92 parts		
R Lin. Camph. Co.	℥j	R Oleum Terobinthinæ	℥j
Lin. Saponis	℥j	Lin. Belladonnæ	℥j
Lin. Aconiti	℥j	Lin. Saponis	℥j

MALARIA

Small doses of Antimony are recommended in relapsing cases. Castellani has been successful with the following prescription No. I:—

No. I.		No. II.	
R Quinine Sulph.	gr. 10	R Ferri Hypophosphate	gr. 2
Acid Sulph. Dil.	℥ 10	Arsenious Acid	gr. 1/50
Tartar Emetic	gr. 1/4	Strychnine Sulph.	gr. 1/50
Codeine	gr. 1/4	Saccharin	gr. 1/100
Syrup	℥j		
Aqua Chloroformi ad.	℥j		
t.d.s.			

No. II, a prescription of Manson-Bahr's, is an efficient means of giving Arsenic, which is second only to quinine in value in the treatment of malaria.

MOUTH-WASHERS

R Glycerine Acid Carbol.	℥ss	R Pot. Chlor.	℥ij
Sod. Bicarb.	℥ij	Pot. Bicarb.	℥j
Aquam ad.	℥vii	Sod. Bicarb.	℥j
		Aquam ad.	℥xii
R Acid Salicylici	gr. 20	R Pot. Chlor.	gr. 45
Acid Benzoici	gr. 20	Sod. Biborate	gr. 45
Saccharini	gr. 2	Citric Acid	gr. 80
Glycer. Boracis	℥iss	Ess. Limonis	℥ 5
Glycer. Acidi Carbolici	℥ 80	Glycerine	℥v
Sp. Vini Rectificati	℥j	Aquam ad.	1 pint
Eau de Cologne ad.	℥iv	(Bellingham Smith and Feiling.)	
Two teaspoonsful in 5 ounces of warm water.			

When ulceration is present

R Hydrogen Peroxide (20 Vols.)	500 parts	R Pot. Chlor.	℥ij
Oleum Ment. Pip.	1 part	Borax	℥ij
Saccharin Elixir	80 parts	Sanitas	℥iv
Thymol Water	470 parts	Aquam ad.	oz. 16

NASAL WASHES

R Sod. Bicarb.	gr. 5	R Sod. Bicarb.	gr. 8
Sod. Biborat.	gr. 5	Sod. Biborat.	gr. 8
Sod. Chlor.	gr. 5	Acid Carbolic	gr. 1
Sacchari Alb.	gr. 5	Sacchari Alb.	gr. 5
One powder to be added to 8 oz. of water.		Aquam ad.	℥j
		Equal parts to be used with water.	

R Sod. Bicarb.	3ij	R Pot. Chlor.	3iv
Sod. Biborat.	3ij	Sod. Biborat.	3iv
Listerine	3j	Pot. Bicarb.	3iv
Glycerine	3iv	Sacch. Alb.	3j

One drachm to be added to 2 oz. of water. $\frac{1}{2}$ oz. in a pint of water.

All the above are prescriptions by Sir St. Clair Thomson.

R Sod. Chloride	...	...	gr. 7
Boracic	...	...	gr. 2 $\frac{1}{2}$
Acid Borici	...	...	gr. $\frac{3}{4}$
Sod. Benzoate	...	...	gr. $\frac{1}{2}$
Menthol	...	...	gr. 1/50
Thymol	...	...	gr. 1/100
Betacaine Hydrochlor.	...	...	gr. $\frac{1}{8}$
Oleum Gaultherie	...	...	m 1/20

To one crushed tabloid add from 1 to 3 oz. of water.

NERVOUSNESS

Nervous excitable patients with restless nights

R Amm. Bromide	gr. 3
Sod. Bromide	gr. 3
Pot. Bromide	gr. 3
Liq. Arsenicalis	m 3
Syrup Pruni Virg.	3j
Aquam ad.	3ss

A tablespoonful in water, t.d.s.p.c.

Nerve Sedative

R Zinc Valerianatis	gr. 2
Ext. Hyos.	gr. 2

One pill twice daily.

Nervous Palpitation

R Tr. Digitalis	m 2
Tr. Belladonna	m 2
Tr. Aconite	m 1
Inf. Gentian Co. ad.	3ss

t.d.s.

NEURALGIA

In cases with severe pain, anæmia and defective nutrition

A good Analgesic combination is:—

R Quinine Hydrochlor.	gr. 5	R Codeine	gr. $\frac{1}{2}$
Acid Hydrobromic Dil.	m 20	Caffoin	gr. $\frac{1}{4}$
Tr. Gelsemium	m 10	Phenacetin	gr. 4
Aqua Chloroformi ad.	3j	Aspirin	gr. 4

Every 20 minutes until pain ceases.
Give 4 doses only.

One cachet.

ESOPHAGITIS

Women who complain of a lump in the throat

R Bismuth Carb.	...	...	gr. 20
Liq. Ext. Hyos.	...	...	m 0
Pulv. Trag. Co.	...	...	q.s.
Aquam ad.	...	...	3ss

Taken 10 minutes before meals.

PAINTS

Throat Paints

℞ Carbolic Acid	gr. 10 to 12	℞ Iodine	gr. 6
Tr. Iodi.	℥ 80	Pot. Iodide	gr. 20
Glycerine ad.	℥j	Oleum Menth. Pip.	℥ 5
		Glycerine ad.	℥j
℞ Potassium Alum.			
(Iron Free)	1 part		
Glycerine. Dissolve with heat	6 parts		
Then add :			
Tannic Acid	1 part		

Mandl's Paint.

Analgesic Paints

℞ Oleum Camphoræ	℥j	℞ Menthol	1 part
Chloroformi	℥j	Thymol	1 part
Oleum Menth. Pip.	℥iij	Chloral Hydrate	1 part
Liq. Aconiti	℥iij	Camphor	8 parts

SPONGY GUMS

℞ Tr. Myrrhæ	℥iv	℞ Pulv. Myrrhæ	℥j
Tr. Kino	℥iv	Pulv. Karameris	℥iij
Glycerin Acid Boric	℥j	Pulv. Camphoræ	℥j
Aqua Coloniensis	℥iij	Cretæ Præcip.	℥iij

A teaspoonful in a wine glass of water for brushing the teeth and rinsing the mouth night and morning.

Use as a dentrifice twice daily.

STIMULANTS

The following are powerful and diffusible stimulants which would not be recognized as alcohol :—

℞ Tr. Aurantii	℥ij	℞ Sp. Ætheris Nit.	℥ 80
Sp. Ætheris	℥ss	Sp. Amm. Aromat.	℥ 80
Sp. Amm. Aromat.	℥ss	Sp. Amoricæ Co.	℥ 80
Tr. Nux Vom.	℥ 10	Aqua Camph. ad.	℥j
Aqua Chloroformi ad.	℥j		
℞ Liq. Ext. Kolæ	℥ss		
Ext. Carnis	gr. 10		
Ext. Malti	℥j		
Vinum Cocæ ad.	℥j		

Three or four times daily.

STOMATITIS

See Mouth-washes.

STYPTICS

A useful Styptic

℞ Acid Benzoici	...	...	5 parts
Acid Tannici	...	...	10 "
Balsam Peru	...	...	2 "
Collodii Flex.	...	...	88 "

SUNBURN

The Lotion

R Hydrarg. Perchlor.	gr. 2
Glycerini	ʒss
Tr. Benzoin Simp.	ʒj
Amygd. Amara	ʒij
Aqua Sambuci ad.	ʒvii

The Lotion

R Glycerine Plumbi Subacet.	ʒiv
Aqua Laurocerasi	ʒj
Aqua Rosæ ad.	ʒvii

SUPPOSITORIES

R Liquid Ext. Belladonna	m 2½	R Morphine Hydrochloride	gr. ½
Oil of Theobroma	to gr. 15	Oil of Theobroma	to gr. 15
R Cocaine Hydrochloride	gr. ½	R Tannic Acid	gr. 8
Oil of Theobroma	to gr. 15	Oil of Theobroma	to gr. 15
R Glycerine	gr. 42	R Hamamelin	gr. 8
Gelatin	gr. 8½	Zinc Oxide	gr. 10
Water	to gr. 60	Oil of Theobroma	to gr. 80
R Iodoform	gr. 8	R Lead Acetate	gr. 8
Oil of Theobroma	to gr. 15	Opium	gr. 1
		Oil of Theobroma	to gr. 15

SWEATING

Sweating hands

R Tannin	ʒj
Spt. Rectif.	ʒvi
Eau de Cologne	ʒij
Aquam ad.	ʒvii
R Liq. Strychnine	m 8
Acid Phosph. Dil.	m 12
Tr. Belladonna	m 8
Tr. Digitalis	m 8
Syrup Aurantii	ʒss
Aqua Chloroformi ad.	ʒss

To check sweating from Nervous Depression after influenza, etc. A dose after breakfast and lunch.

Sweating feet

R Pulv. Alum Opt.	gr. 20
Pot. Permang.	ʒij
Talc Pulv.	ʒj
Zinc Carb.	ʒss
Zinc Oxide	ʒss

Sweating axillæ

R Acid Salicyl.	gr. 20
Pulv. Amyli Opt.	ʒij
Pulv. Aluminis	ʒiss

R Tr. Agarici	m 80
Tr. Ergotæ	m 15
Sy. Aurantii	ʒss
Aq. Chloroformi ad.	ʒss

To check profuse.

TONICS

R Tr. Nux Vom.	m 6	R Acid Phosph. Dil.	m 15
Acid Nitro-Hyd. Dil.	m 8	Liq. Strychnine	m 8
Tr. Gentian Co.	m 10	Spt. Chloroform	m 10
Aqua ad.	ʒj	Inf. Quassia ad.	ʒj

t.d.s.

t.d.s.

R Acid Phosph. Dil.	m 15	R Liq. Arsen. Hydrochlor.	m 8
Tr. Ferri Perchlor.	m 10	Tr. Ferri Perchlor.	m 15
Spt. Chloroform	m 10	Inf. Quassia ad.	ʒj
Inf. Quassia ad.	ʒj		

t.d.s.

t.d.s.

R Ferri Amm. Cit.	gr. 5	R Ferri Amm. Cit.	gr. 8
Taq. Amm. Fort.	m 1½	Syrup Aurantii	ʒss
Spt. Myristicæ	m 5	Inf. Churao ad.	ʒj
Inf. Calumbæ ad.	ʒj		t.d.s.
	t.d.s.		
R Phosphorus	gr. 1/50	R Strychninæ	gr. 1/30
Quinine Sulph.	gr. ½	Phosphorus	gr. 1/30
Strychninæ	gr. 1/50	Ferri Sulph. Exsicc.	gr. 1
Acid Arsenious	gr. 1/50	Pil. Coloc. et Hyos.	gr. 1
	t.d.s.		t.d.s.
R Sod. Sulph.	gr. 9	R Sod. Sulph.	gr. 15
Sod. Phosph.	gr. 6	Liq. Strychnine	m 5
Acid Nitro-Hyd. Dil.	m 9	Liq. Ext. Cascara	m 5
Tr. Capsici	m 8	Tr. Cardam. Co.	m 30
Tr. Aurantii	m 9	Aqua ad.	ʒj
Inf. Gentian ad.	ʒj		t.d.s.
	t.d.s.		
R Tr. Quininæ	m 30	R Liq. Strychninæ Hydrochlor.	m 4
Acid Hydrobrom. Dil.	m 30	Acid Phosph. Dil.	m 15
Mag. Sulph.	gr. 20	Quinine Hydrochlor.	gr. 1
Tr. Nux Vom.	m 5	Liq. Arsenic Hydrochlor.	m 4
Syrup Zingiberis	m 30	Tr. Gentian Co.	m 30
Aqua Dest. ad.	ʒj	Syrup Limonis	m 30
		Aqua Chloroformi ad.	ʒss
			A tablespoonful in water, t.d.s.
R Ferri Amm. Cit.	gr. 10	R Ferri Amm. Cit.	gr. 8
Liq. Bismuthi Amm. Cit.	ʒij	Tr. Quininæ	m 30
Liq. Fowleri	m 5	Syrup Aurantii	ʒj
Aquam ad.	ʒss	Inf. Aurantii Co. ad.	ʒj
	t.d.s.		

TONICS FOR CHILDREN

The following are useful:—

R Tr. Nux Vom.	m 1½	R Acid Nitric Dil.	m 1½
Acid Nitro-Hyd. Dil.	m 1½	Glycerine	m 10
Inf. Gentian Co. ad.	ʒj	Inf. Calumba ad.	ʒj
	t.d.s.		t.d.s.
R Liq. Ferri Perochlor.	m 2	R Ferri Amm. Cit.	gr. 2
Glycerine	m 5	Pot. Cit.	gr. 2
Inf. Quassia ad.	ʒj	Glycerine	m 10
	t.d.s.	Inf. Calumba ad.	ʒj
			t.d.s.
R Mag. Sulph.	gr. 5	R Liq. Strych. Hyd.	m ½
Acid Sulph. Dil.	m 1	Acid Phosph. Dil.	m 5
Ferri Sulph.	gr. ½	Tr. Gent. Co.	m 10
Syrup Zingib.	m 2	Aqua Carui ad.	ʒj
Aquam ad.	ʒj		t.d.s.
	t.d.s.		

TOOTHACHE

℞ Acid. Carbolic Cryst.	gr. $\frac{1}{8}$	℞ Acid Carbolic	gr. $\frac{1}{8}$
Chloral Hydras.	gr. $\frac{1}{4}$	Cocain Hydrochlor.	gr. $\frac{1}{8}$
Camphoræ.	gr. $\frac{1}{4}$	Mix and place in hollow tooth, protect with wool and gutta-percha stopping.	
Thymol.	gr. $\frac{1}{4}$		
To be applied to the hollow tooth on a plug of cotton wool.			

TEETHING

For Infants when teething

R Pot. Bromide	...	...	gr. 2
Syrup Papav. Alb.	...	...	m 5
Aqua Anethi ad.	...	...	3j

A teaspoonful occasionally.

URINARY ANTISEPTICS

The following are useful prescriptions for giving urinary antiseptics:—

R Hexamine	gr. 10	R Pot. Citrate	3j
Syrup Auranti	3ss	Tr. Hyos.	3ss
Aqua Dest. ad	3j	Emuls. Chloroformi	m 10
Every 4 hours.		Inf. Buchu ad.	3j
		t.d.s.p.c.	

R Hexamine	gr. 12	R Hexamine	gr. 12
Acid Sod. Phosp.	gr. 15	Sod. Benzoate	gr. 12
Tr. Hyos.	3ss	Sp. Chloroformi	m 10
Sp. Chloroformi	m 15	Inf. Buchu ad.	3j
Inf. Buchu ad.	3j	t.d.s.p.c.	
t.d.s.p.c.			

VAGINAL DOUCHES

Antiseptic Douches

(1) Lysol	3j—Oj
(2) Cylin	3ss—Oj
(3) Izal	3j—Oj
(4) Sanitas	3j—Oj
(5) Tr. Iodine	3j—Oj
(6) Perchloride or Biniodide of Mercury	both 1 in 4,000

Astringent Douches

(1) Aluminis	3j—Oj
(2) Zinc Sulphate	3j—Oj
(3) Tannin	3ss—Oj

Sedative Douches

(1) Sod. Bicarb.	3j—Oj
(2) Tr. Opii	3j—Oj
(3) Chloral Hydras	3ss—Oj
(4) Liq. Plumbi Subacetatis	3ss—Oj

A useful formula is—

R Pot. Chloride	gr. 8
Sod. Chloride	gr. 50
Sod. Sulphas	gr. 2½
Sod. Carb.	gr. 2½
Sod. Phosph.	gr. 2

To a pint of hot water.

Fetid Discharge

R Glycerini Acidi Tannici	...	...	℥vi
Glycerini Acidi Carbolici	...	...	3j

A teaspoonful to be added to a pint of lukewarm water and used as a douche every morning.

VAGINAL TAMPONS

The tampons may be made in the form of a rope, pledgets of cotton-wool tied in the form of a kite's tail, strips of medicated gauze, or a single ball of wool.

The following are employed for soaking the plugs :—

Glycerine;
or Boroglyceride.

or R Ichthyol Ammon. Sulph.	℥j
Glycerine ad.	℥ix

One or two ounces on plugs.

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NOTES ON TREATMENT

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MODERN METHODS OF ELECTRICAL TREATMENT

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This article is written for the general practitioner in order to show the value of electrical treatment as practised at the present day, to give reasons for its usefulness, and to indicate the part which he can play in electrotherapy. Electrotherapy is not entirely a modern form of treatment. With the exception of those oscillating with enormously high frequency, the currents now used were originally employed for medical purposes before the present century. The qualification 'modern' when applied to electrical methods of treatment is intended to signify that they are employed scientifically, that is, with knowledge of their effect on pathological states and the ways in which these effects are brought about. This knowledge did not exist before 1900, and electricity was employed empirically and for diseases for which it was unsuitable. Quacks flourished and the profession reserved it for the helpless and hopeless cases which they wanted to get rid of.

Although much still remains to be discovered we now possess sufficient knowledge to make electrical treatment relatively scientific. Thus employed the treatment is modern. When disease fails to respond, or is unlikely to respond, to the simplest forms of treatment, such as internal or external medication, or to those simple forms of thermotherapy which the patient can apply himself, such as hot-water bags and poultices, the practitioner will want to know if any of the various forms of physical therapy are likely to be effective. A certain amount of information on the subject can be found in books on general treatment, but difficulty arises when more than one form of physical treatment is mentioned for the same disease. For this reason it would not be sufficient in an article dealing with electrical treatment merely to give a list of maladies with a statement of the results that may be expected from this form of treatment. A number of these maladies would be found in the lists compiled by specialists in other forms of physical therapy, especially diseases, such as

arthritis, fibrositis, neuritis, and sciatica, which provide so many cases difficult to treat satisfactorily by simple methods.

For these reasons the best way of showing the value of present-day electrical methods appears to be a preliminary description of the ways in which they act in the treatment of disease and contrast them with the methods of action of the other physical and non-physical remedies that may be recommended for the same malady. It will, then, be more easy to realize what electricity has to offer. If the value of electrotherapy, in comparison with other forms of treatment, physical as well as non-physical, could be assessed in terms of the final therapeutic results the difficulties in the way of selection would diminish or disappear. But until physical therapy has been standardized in all its branches the proper field for each one cannot satisfactorily be defined. And until team-work is established it will be difficult to say when physical therapy should be the treatment of choice, or when one form of this treatment should be replaced by another, or when they should be used in combination.

In treating disease or injury, electricity acts in one of three ways: (1) by heating the tissues; (2) by producing chemical changes in them; and (3) by stimulating muscle and nerve. Certain advantages are gained if electricity is chosen for producing these effects. They are as follows: (1) when electricity is used as a thermotherapeutic agent it can raise the temperature of parts which are too deeply situated to be reached by heat applied externally. An electric current is passed through the tissues. It produces heat by overcoming their resistance. The heat is generated in the superficial and deep tissues alike. In other words, *diathermy* is produced. The current is known as a *diathermic* current. (2) Electricity can produce chemical caustics within the tissues. The quantity formed is under the control of the operator. The destruction of abnormal tissue by this method is a form of treatment known as *electro-chemical cauterization*. The galvanic current is used for the purpose. The same current is used for treatment by a process which cannot be copied by other agents. Thus when solutions of therapeutic chemicals (drugs) are placed in contact with the skin or mucous membrane, the galvanic current can make them penetrate to a depth which cannot be reached by the simple process of diffusion. This constitutes a form of treatment known as *medical ionization*. (3) The use of electricity for stimulating muscle and nerve enables us to bring about one effect, at least, which cannot be achieved by other artificial agent. Voluntary muscle can be made to contract; it can be made to give a twitch, or a series of twitches, or a prolonged contraction, both when voluntary power is preserved and when it is lost. Faradic and sinusoidal currents are generally used for procuring contraction

when reactions of the muscle are of the normal type. If, in addition, the use of electricity has an encouraging effect on the patient's mind, it should not therefore be deprecated, and the therapeutic nihilist will be furnished with a reason for attributing some value to it.

The best examples of the power of electricity (in the form of the diathermic current) to raise the temperature of the parts which are inaccessible to heat derived 'ready made' from external objects, are seen in the male and female pelvic organs. Not only is it possible to heat the female urethra, the cervix, the body of the uterus, the tubes, ovaries, prostate and seminal vesicles, the anal canal and rectum, and the pelvic cellular tissues, but the therapeutic results in certain diseases of these parts are striking and far-reaching. By means of an ingenious method devised by C. A. Robinson an infected and inflamed cervix uteri can be heated by diathermy to the maximum temperature that is considered advisable, namely, 115°F. A course of this treatment will free the cervix from infection by pathogenic organisms, such as gonococci and hæmolytic streptococci. The importance of achieving such a result is obvious in view of the possible consequences of untreated cervicitis. One of the most serious is infective arthritis, which is very commonly due to primary infection of the cervix uteri, far more frequently, indeed, than to primary infection of any other part even.

If arthritis has developed it is not too late to disinfect the cervix by diathermy, and the treatment is urgently necessary, otherwise the arthritis will progress and further damage result. If, however, the infection is eradicated from the cervix, the arthritic inflammation will cease. The final condition of the joints will depend on the amount of structural damage infected before the treatment of the cervix was commenced. If the case is early and no damage has taken place, a real cure will be effected. The following symptoms may indicate that a woman with cervicitis may develop infective arthritis: deterioration of general health, undue fatigue on exertion, the occurrence of bruises on the body which cannot be accounted for, loss of healthy colour and muddy complexion; these symptoms indicate toxæmia. C. A. Robinson has shown that chronic low backache is commonly due to cervicitis, disappears after removal of the cervicitis by diathermy, and that the occurrence of this symptom in women with cervicitis is the prelude to infective arthritis. The removal of the cervicitis by diathermy and the elimination of the source of the toxins are followed by striking improvement in the general health, the sense of fatigue disappears and her colour and activity return. The results are among the most satisfactory in the whole realm of therapeutics. By means of the diathermic current it is possible, as already

stated, to heat the fallopian tubes and the ovaries. Chronic salpingitis, if non-tuberculous, can be brought to an end by diathermy, though surgical treatment is necessary in the suppurative forms. Heating the ovaries by diathermy appears to increase their endocrine activity, especially when that function is waning at the climacteric; this may explain the amelioration, by pelvic diathermy, of certain troubles liable to occur at this time of life, for it may be assumed that the heat enables the ovaries to maintain their endocrine function until the other ductless glands can compensate for the loss. Among the troubles referred to above is a form of non-infective arthritis which, in its early stages, can be arrested by subjecting the pelvic contents to diathermy. There is good evidence that the direct action of the treatment is on the ovaries.

In male subjects the prostate and seminal vesicles are even more inaccessible than the cervix uteri to treatment by simple methods. They can, however, be heated by diathermic current. They are very liable to infection, particularly by the gonococcus, which may spread to the epididymis, and there is always the possibility that metastatic inflammation of the joints and fibrous tissues may follow. The results of diathermy on the infected prostate and seminal vesicles and on the joints and fibrous tissues are no less satisfactory than those obtained in women when infective arthritis is treated by subjecting the cervix to diathermy. Epididymitis can be made to disappear if the prostate and vesicles are treated by diathermy, even though the contents of the scrotum are not included in the path of the current. But if the last-mentioned parts are subjected to diathermy at the same time as the prostate and vesicles, pain will actually begin to diminish during the first treatment. After three treatments and the expiration of ten days pain, tenderness and swelling will have gone. In some cases there remains a slight thickening of the globus minor, but without pain or tenderness. These results, in comparison with those obtained by applying hot objects to the scrotum, furnish a striking example of the relative values of diathermy and 'epithermy'.

Brief reference may be made to a few more modern developments in the use of diathermy; in puerperal infection, in which it was first realized and undertaken by C. A. Robinson, a much higher percentage of cures has been obtained than by any other method; he has treated ninety cases, and will publish his results when the number reaches one hundred. The low mortality-rate is a veritable triumph for diathermy.

Diathermy is now employed to raise the temperature of the whole body to 105°F. and to procure the so-called 'therapeutic fever', in general paralysis of the insane it yields as high a proportion of successful results as the artificial production of

malaria and, moreover, is safer. Mention might also be made of the use of a current (belonging to the same family as the diathermic current) in the treatment known originally as fulguration, or better as electro-desiccation. In this form of treatment abnormal tissue is killed by directing sparks on it. Those who have not heard of it may be inclined to laugh. It is true that other methods, such as burning and chemical cauterization, will destroy tissue. The sparks dry or desiccate the tissues, and the subsequent reaction is much less, and the cosmetic results far better than those of the actual cautery or chemicals; the scars are soft, smooth and never contract. In a patient with a vascular fibrous growth of a vocal cord treated by electro-desiccation voice was fully regained and the scar left was almost imperceptible.

Various examples can be given to show how the employment of electricity (in the form of the galvanic current) for introducing germicidal or cauterizing ions can achieve success in diseases in which the simple application of solutions or solids to the surface usually fails. The value of the electrical method (ionization) can be seen in the treatment of cervicitis; although a much greater experience has been obtained with diathermy in this disease, ionization is much more effective than the treatment commonly employed, *viz.* the packing of the cervical canal with germicidal preparations, and will succeed when the last-mentioned method fails. If a zinc rod is placed in the canal and connected to the positive pole of a galvanic battery there will be a migration of zinc ions into the mucous membrane. They will kill bacteria on their path. They will unite with the tissue proteins and form zinc albuminate which provides a sterile protective lining and remains in position for ten to fifteen days. During this time reinfection from without cannot take place. If, on the other hand, the zinc rod is connected to the negative pole of the battery there will be a migration into the cervix of hydroxyl ions which have germicidal properties and in addition act indirectly on the glands of the cervix and increase their secretion for a day or more after the ionization, thus securing most efficient drainage. When the discharge is inspissated it is advisable to begin the treatment with the zinc rod attached to the negative pole, and when free drainage is established the rod should be connected to the positive pole so that the protective lining of the zinc albuminate may form.

From what has been said of the value of diathermy and ionization in cervicitis the reader may conclude that vaginal irrigation and packing the cervical canal with germicidal preparations is of little value in the treatment of this disease and the metastatic and constitutional troubles that arise from it. As a matter of fact, during the years when the writer and Dr.

U. A. Robinson were investigating the effects of diathermy on the pelvic organs, all their patients had been previously treated unsuccessfully by the methods named.

Zinc ionization is of value in the treatment of chronic inflammation, with or without ulceration, of the mucous membranes of other parts as well as the cervix. Special mention must be made of the middle ear, the nasal cavities, the colon and the rectum, for it is in chronic and persistent inflammation of these parts that the electrical method is usually successful when the customary treatment fails. Chronic suppurative otitis media can be brought to an end by one, or at the most two, applications of the treatment, if caries of bone is absent; papillomas and cholesteatomas, if present, must first be removed. One of the special advantages of the electrical method is that the patient need not be admitted into a hospital or nursing home. *The pioneer work on the treatment of this disease by zinc ionization was conducted by Friel.* Chronic catarrhal rhinitis can frequently be brought to an end by zinc ionization after irrigation or spraying has failed. This is also true of hay fever. The value of zinc ionization in chronic ulceration colitis, which was known to specialists in electrotherapy before the beginning of the present century, has recently been confirmed by Julius Burnford. In chronic infective proctitis the introduction of zinc ions by the galvanic current is a very effective form of treatment. It appears to act as a specific, although this word cannot properly be used when the cause of the disease is unknown.

The following examples illustrate the value of the galvanic current as a cauterizing agent. A fine needle electrode can be placed in the follicle of an unwanted hair. The passage of the current leads to the formation of caustics around the needle. The caustics destroy the follicle, and the hair with its pigmented bulb can be lifted out. If the needle is insulated, except at its free end, the cauterization can be restricted, with precision, to the base of the follicle, the skin being undamaged. By inserting the tip of a zinc needle into the central vessel of a stellate vein or the base of a pedunculated wart and passing the current the whole of the stellate vein or the entire wart will disappear, leaving no mark. As already stated, the value of the galvanic current as a cauterizing agent is that it produces the caustics in the situation needed and in the amount desired. Another advantage is the slight reaction after the treatment and the excellence of the cosmetic results.

Among the morbid conditions in which electricity is useful, on account of its power of stimulating the excitable tissues, the most obvious are those in which some muscular weakness and wasting persist after the responsible factors have ceased to act;

thus, when inflammation in a joint, due to injury or disease, has subsided, the muscles controlling the movement of the joint can be helped to regain their power if they are artificially exercised by the faradic or sinusoidal current. This help is required when the patient cannot use the muscles or cannot use them adequately; thus, when extension of the knee is weak and limited, the vastus internus may be more wasted and weak than the rest of the quadriceps. This part of the muscle can be given a greater share of artificial exercise, and an increase in its size can be seen to take place. When muscles are weakened or paralyzed in consequence of disease or injury of their motor nerves, recovery can be accelerated if they are artificially exercised by electrical methods, provided, of course, the injury or disease has been adequately treated. Further, most patients are encouraged when they see their paralyzed muscles contract.

Electrical contraction of muscle can usefully be practised when movement is painful in consequence of adhesions left between muscle and fibrous tissue in cases of past fibrositis; the contraction should take the form of separate twitches, thirty or so, per minute; the twitches are painful at first, but the pain soon diminishes and disappears while the initial treatment is being administered. The range of painless movement can gradually be increased by this method. A preliminary application of heat, especially diathermy, hastens the results, if it is made before the twitches are produced. An induction coil provided with a slowly acting interruptor may be used, but the twitches can be more effectively obtained by means of the static machine when large masses of muscle, such as the gluteal and lumbar, are involved.

The diseases chosen, so far, are some of those which resist, or do not respond well, to forms of treatment other than electrical; and the reasons why electrical treatment produces its results are easy to understand. Other maladies which often respond to simpler forms of treatment can be treated electrically with fair prospect of success should the other methods fail. In these also the mode of action of the electricity is evident. There are yet other diseases which react better or more quickly to electricity; but in these the mode of action of the treatment is obscure or uncertain. When this is the case the usual custom is to proscribe rather than prescribe electrical treatment, and select some other form of therapy in which the *modus operandi* is known. For three-quarters of a century it has been acknowledged that the galvanic current is of particular value in relieving the pain and accelerating the resolution of inflammation, especially after injury. In a few quarters the current is used for this purpose, but more commonly all forms of electrical treatment in cases of injury are barred, and if any kind of physical

treatment is prescribed, it is massage—the mode of action of mechanical treatment being more readily understood than that of electricity. In cases of recent trauma, without fracture or dislocation, it would seem inadvisable to procure contraction of the muscles controlling the joint; but ‘things are not what they seem’. Treatment of this kind is actually beneficial. Its effects cannot entirely be attributed to the contraction of the muscles; and while uncertainty exists the treatment will not be practised as widely as its efficiency deserves. Those who are interested should consult the book by Morton Smart, who conducted much of the pioneer work on the subject.

The value of the sinusoidal current, administered in full-length baths, in poliomyelitis, after the acute stage has subsided, is known to few. It was introduced by the late Lewis Jones, who practised the treatment for many years at St. Bartholomew's Hospital. The current does not cause contraction of muscles showing the reaction of degeneration, and when administered by the bath method its strength is not raised to a value sufficiently high to make the normal muscles contract. This reason and the fact that the method of action of the current is not precisely understood are responsible for the present neglect of the sinusoidal current in the treatment of poliomyelitis.

The second purpose of this article is to consider how far, in the interests of his patient, the general practitioner should undertake electrical treatment, in whole or in part. Before this question is discussed, it should be realized that there is a public demand for electrical, as well as other forms of physical treatment. This is met in various ways; the Chartered Society of Massage and Medical Gymnastics has a roll of more than 8,000 members, most of whom have also been trained to administer treatment by the galvanic, faradic, sinusoidal and diathermic currents, and by radiant heat and ultra-violet rays; they hold certificates of proficiency, duly tested by examination by medical specialists in these subjects. They only receive patients sent by a doctor and await his instructions as to the kind of treatment to be given. In addition to members of the Chartered Society there are a great many independent non-medical administrators of physical treatment who have picked up some knowledge of the subject and are not bound by a charge, such as the Chartered Society imposes on its members, to receive as patients only those sent by medical men. The County Councils are beginning to add departments of electrical and physical therapy to the municipal hospitals, one of which is probably the finest and best equipped in the kingdom. There are various institutes run by non-medical men and women who advertise for and receive patients. Pretending to make a diagnosis by hearing the patient's symptoms (a stethoscope, perhaps, being placed

on the desk) they administer any form of treatment they think fit or the patient has a fancy for. These institutes have arisen in response to public demand, and it must be admitted that the other schemes for the supply of electrical treatment have arisen more in response to a public than to a professional demand; a committee of laymen originated the fine department specially mentioned above. As time goes on, the demand for electrical and other forms of physical treatment, in place of the bottle of medicine, is certain to increase. Since it has long passed its era of empiricism and has a value of its own in a number of diseases, the request for electrical treatment, on the part of the patient, should be sympathetically considered by the practitioner. Even if the patient does not ask for it, the doctor should know whether or not it is advisable, what form to prescribe, and must decide who is to administer it. It must be realized first of all that special training and experience are necessary before electrotherapy, as it is to-day, can properly be practised. Gone are the days when a practitioner could spend an afternoon in the electrical department of a hospital, see cases treated, and then practise electrotherapy. The subject has extended so widely in recent years that knowledge is required of physics, electrotechnics, the nature and biological properties of different currents, and the various methods of using them in the treatment of diseases of the eye, ear, nose, uterus, urethra, prostate, rectum and colon. There is no region of the body which is not treated by electrical methods for one disease or another. If a practitioner obtains the requisite knowledge and experience he becomes a specialist, and if he administers the treatment to such cases in his practice that will benefit from it (and can pay for it), he will have no time for general medical work. If he wishes, however, to continue in general practice it is in his power to do an immense amount of good, and it is not too much to say that the future of electrotherapy lies largely in his hands. It is to him patients first come. If he knows the diseases and cases for which electrical treatment is indicated (either as the treatment of choice, or as one which holds out a reasonable prospect of success after simple methods have failed) and makes arrangements for it to be conducted by those who are properly trained to do it, the subject of electrotherapy will come much more under the regis of the medical profession than at present. But if the patient is left to find out for himself that electrical treatment is of value in his complaint, he is more likely to go to an 'institute' or to some unqualified worker who treated one of his friends, than to a doctor. Actions of this kind will increase the belief which prevails, on the part of the public, that anybody who possesses the apparatus and knows how to connect the patient to it, can practise electrotherapy. It is probably true that no branch of treatment is so widely practised by the untrained worker and is so little recognized by the medical profes-

sion as electrotherapy. More is known of treatment by the public now than a generation ago, and if the practitioner remains apathetic, the subject of electrotherapy will pass out of the hands of the medical profession.

A practitioner who knows when electrical treatment is indicated, but has not the time, or is unable, to conduct it himself, there is much that can be done under his direction by the members of the Chartered Society who have been trained how to administer electrical treatment. In his capacity as examiner for several years the writer can say that they know their work well and conduct it conscientiously, that some of them are wide readers of books on electrical and physical therapy, not only from interest, but also because they may not receive any instructions about the form of electrical treatment to be administered. As the members of the Chartered Society are charged not to treat patients who do not come from a doctor, the doctor should adopt a reciprocal attitude and refer his patients to them.

For the progress of electrotherapy there is need for medical specialists as well as trained non-medical administrators. The former are necessary to take charge of electrical departments in hospitals and give instruction to the administrators of the treatment. They are necessary, also, for conducting more elaborate forms of treatment which cannot be administered by members of the Chartered Society. These include the surgical forms of electrical treatment as well as those which require special skill and experience (such as the application of diathermy to the cervix uteri) and those which require knowledge of medicine and changing pathological conditions for their efficient practice (such, for example, as the use of diathermy for the treatment of hyperpiesia). But it is on the action and attitude of the general practitioner that the practice and progress of medical electricity on right lines will most largely depend.

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EXERCISE

Of exercise in general, it may be said that the necessary amount depends upon individual requirements, which vary enormously. A powerful factor, however, in determining the amount, is the quantity of food eaten. The person who eats largely, must take plenty of exercise; if this is impossible, the amount of food must be reduced. This is an important point with Indians, as it is a matter of experience that those Indians who allow themselves to put on an excessive amount of abdominal fat, are very liable to develop diabetes; to avoid this, walking is not sufficient, as the abdominal muscles must be exercised, to ensure adequate support of the internal organs, and to prevent abdominal venous stasis, which is such a fruitful source of disorders resulting from deficient metabolism.

Riding is excellent for stimulation of the liver; and there is undoubtedly much truth in the saying: 'The outside of a horse is the best thing for the inside of a man.' Tennis and golf are good exercise—also rowing, which exercises the abdominal muscles. Hockey in India should not be played by Europeans after 28 to 30 years of age.

There are several systems of exercises, the majority of which, as entailing no violent exertion, and tending to keep most groups of muscles in good conditions, can be confidently recommended to healthy persons.

MULLER'S SYSTEM.—This only entails 15 minutes' time every morning, is an excellent system for all classes and ages, being graduated for men, women, and children this system keeps abdominal muscles in good condition, and if it were more generally used by women, there would be fewer cases of floating kidney and other abdominal and pelvic trouble.

Whatever form of exercise is used, it is essential that it should be performed either in the open air or in a room with all the doors and windows wide open.

Exercise is used in conjunction with massage in several special methods of treatment and is of considerable benefit in cardiac disease, especially when the heart muscle is flabby and lacking in tone, but is contra-indicated in cases of severe heart failure, acute affections and considerable myocardial degeneration. Exercise may be given even when the patient is in bed, but must always stop short of distress.

NAUHEIM TREATMENT.—This consists of (1) Exercises, (2) Massage, (3) Saline and aerated saline baths. An artificial Nauheim bath can be made from Sandow's powders and tablets. The exercises are a series of movements which are made against

gradually increasing resistance. The exercises and massage are given at a time of the day different to the bath, and both are followed by a period of rest.

Under these treatments, the tone and power of the cardiac muscle is improved.

SWEDISH EXERCISES AND MEDICAL GYMNASTICS

The following General Rules for a Gymnastic Table are recommended by Dr. J. Avredson of the Gymnastic Institute, Stockholm:—

1. SPECIAL EXERCISES, *i.e.* those which have a direct effect on the pathological condition for which treatment is being undertaken.

2. GENERAL.—(a) To increase the vitality of the body as a whole by increasing the supply of oxygen, and so stimulating metabolism. (b) Aiding the digestive organs, and so improving digestion, absorption and ultimately nutrition. (c) To help the general circulation, and so promote the distribution of nutriment and removal of effete products. (d) A promotion of general increase of activity in the cells.

When both special and general exercises have been chosen, they are combined to form a treatment table. The following is a typical scheme:—

- (1) Respiratory Movements.
- (2) Limb Movements.
- (3) Movements for Neck and Hand.
- (4) Movements for Abdominal Organs.
- (5) Limb Movements.
- (6) Movements for Chest and Back.
- (7) Limb Movements.
- (8) Respiratory Movements.

In the choice of exercises and in the arrangement of the table it should be noted:—

- (1) That the movements and their strength are adapted to the strength of the patient.
- (2) That the easier movements are placed at the beginning and end, and the stronger in the middle of the table.
- (3) That any movement or manipulation should not immediately follow one having the same effect.

- (4) That a movement or manipulation designed to act upon the nervous system, or to produce a certain effect by reflex action, should not be followed immediately by one active movement of the same part of the body. Otherwise, the desired effect in this way will be partly annulled.
- (5) In the treatment of paralysis, kneading, nerve massage and passive movements, precede active movements, in order to increase, as much as possible, the functional power of the muscles and joints.
- (6) Special massage treatment, but not kneading and nerve pressures, should be followed immediately by gentle active movements of the part treated, in order to increase the supply of fresh blood and nourishment to replace the fluids which have been removed by massage.
- (7) In the treatment of Scoliosis and deformities in general, passive corrective movements should be followed immediately by an active movement, with as complete a contraction as possible of those muscles which maintain the correct position.
- (8) The same table should not be used too long without change, but should be varied from time to time, and increased in strength as the patient's strength increases.
- (9) The treatment must not be suddenly stopped, but gradually decreased, so that the patient is gradually accustomed to do without it.

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HELIOOTHERAPY

By C. W. SALEEBY, M.D., F.Z.S., F.R.S. (Edin.)

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HISTORICAL

The earliest modern name in the scientific study of sunlight and health is Bonnet, a surgeon of Lyons, who, as long ago as 1845, was curing tuberculosis of bones, joints and glands with sunlight. Dr. Palm, in 1890, published a valuable paper on sunlight and rickets. Finsen, in 1898, began to cure lupus by sunlight, and Dr. A. Rollier at Leysin began, in 1908, to cure all forms of surgical tuberculosis by sunlight. The importance of the whole subject was not realized in England until attention was drawn to it after my first visit to Leysin in 1921. An article I wrote on the death of Finsen in 1904 was of little avail.

The importance of heliotherapy to India is enormous. Every practitioner knows the great prevalence of the rachitic pelvis among Zenana women, and the shocking increase during the last half century of tuberculosis among all classes.

Admittedly, there are general problems to be solved in the Indian climate, while in England the task is how to protect and use our only just adequate supply of sunlight. In India the problem is how to use the light without getting too much heat.

My formula for mothers is:—

'Fear the heat and love the light,
Keep your children cool and bright.'

It is the sunlight, and especially the cool ultra-violet rays, that serve to prevent and cure disease. The sun's heat is a danger and an obstacle to cure beyond a very limited intensity.

Some Indian physicians, whom I met at Leysin, were profoundly impressed with Dr. Rollier's results, but they were asking themselves how to modify the Indian sunlight for purposes of healing.

Without any method of filtering out the heat rays, the difficulties are by no means insuperable. They are only the same difficulties as are surmounted at Leysin during the summer, and at Spotorno, on the Italian Riviera, during nearly the whole of the year. After all, where the solar radiation is intense, the ultra-violet rays come so abundantly that the bath need not be so long. At Leysin, in the winter, the patients lie in the sun for about three or four hours every day. In the

summer, only the early morning is used, and that is enough. Likewise at Spolorno, and just so must it be in India.

The early morning, far away the best time of day, must be used for heliotherapy. As soon as the orb of day rises above the rim of the horizon, the rickety and the tuberculous must be bathed in it. Even half an hour of such precious light is worth untold gold; and the dose may be repeated towards sunset, though with less convenience in the hotter air. By this method, the earth's atmosphere filters out the heat rays without any cost, and the suitable use of electric fans will do the rest. Would that our problem were as easy in London or Manchester or Glasgow!

Further, as Lieut.-Colonel O'Meara points out to me, India has all climates. There are the hills, and there is the snow. Countless places offer themselves as suitable for the practice of the sun-cure, no less than the Alps; but, hitherto, they have not been used.

I urge this question upon the attention of all who are in touch with the Indian problem, and who wish well to such a vast population. The facts of the sun-cure are now wholly beyond dispute. Elsewhere I have discussed the whole subject in a little volume which has been widely read throughout the English-speaking world, but not in India, where, I confess, the urgent need for some such teaching has only recently been realized by me.

TECHNIQUE

If heliotherapy treatment is being carried out at a hill station in India, the patient should first become acclimatized to the high altitude, and accustomed to open-air treatment, before insolation is begun.

The time of the day is always important, and this is especially the case in India: the early morning is by far the best, as the air is then relatively cool.

Exposure to the sun's rays is begun very gradually, at first to a small area of body surface, which is extended daily. Further, the exposure should not be continuous but with short intervals, for example:—

<i>Part of Body Surface Exposed</i>			<i>Number of Times Exposed</i>	<i>Period of Exposure</i>	<i>Intervals between Exposure</i>
1st Day	...	Feet	8	5 Min.	5 Min.
2nd Day	...	Feet	8	10 Min.	5 Min.
		Legs	8	5 Min.	5 Min.

<i>Part of Body Surface Exposed</i>		<i>Number of Times Exposed</i>	<i>Period of Exposure</i>	<i>Intervals between Exposure</i>
3rd Day	...	{ Feet 8 Legs 8 Thighs 8	15 Min. 10 Min. 5 Min.	5 Min. 5 Min. 5 Min.
4th Day	...	{ Feet 8 Legs 8 Thighs 8 Abdomen 8	20 Min. 15 Min. 10 Min. 5 Min.	5 Min. 5 Min. 5 Min. 5 Min.
5th Day	...	{ Feet 8 Legs 8 Thighs 8 Abdomen 8 Thorax 8	25 Min. 20 Min. 15 Min. 10 Min. 5 Min.	5 Min. 5 Min. 5 Min. 5 Min. 5 Min.
6th Day	...	{ Feet 8 Legs 8 Thighs 8 Abdomen 8 Thorax 8	30 Min. 25 Min. 20 Min. 15 Min. 10 Min.	5 Min. 5 Min. 5 Min. 5 Min. 5 Min.
7th Day	...	{ Feet 8 Legs 8 Thighs 8 Abdomen 8 Thorax 8	35 Min. 30 Min. 25 Min. 20 Min. 15 Min.	5 Min. 5 Min. 5 Min. 5 Min. 5 Min.
8th Day	...	{ Feet 8 Legs 8 Thighs 8 Abdomen 8 Thorax 8	40 Min. 35 Min. 30 Min. 25 Min. 20 Min.	5 Min. 5 Min. 5 Min. 5 Min. 5 Min.
9th Day	...	{ Feet 8 Legs 8 Thighs 8 Abdomen 8 Thorax 8	45 Min. 40 Min. 35 Min. 30 Min. 25 Min.	5 Min. 5 Min. 5 Min. 5 Min. 5 Min.
10th Day	...	{ Feet 8 Legs 8 Thighs 8 Abdomen 8 Thorax 8	50 Min. 45 Min. 40 Min. 35 Min. 30 Min.	5 Min. 5 Min. 5 Min. 5 Min. 5 Min.

After the 10th Day, the head is also exposed and the periods gradually increased, in accordance with the toleration of the patient, until:—

15th day	...	Whole Body	4	80 Min.	15 Min.
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The exposure should be shorter during the hot than in the cold weather. Symptoms of an overdose include a rise of temperature with increased pulse and respiration, malaise, vertigo and insomnia. In order to avoid these, the reaction of each individual case should be carefully studied, and no departure allowed from the systematic increase of dosage. There are wide variations in individual tolerance, and each individual must be studied and treated accordingly.

Cases suitable for Heliotherapy treatment:—

- (1) Surgical Tuberculosis.
- (2) Rickets.
- (3) Convalescents from Acute Conditions.
- (4) Anæmia.
- (5) Chronic Infective Conditions.
- (6) Pulmonary Tuberculosis Early Cases.
- (7) Many forms of Skin Disease, including Lupus.

Contra-indications:—

- (1) Pulmonary Tuberculosis, Advanced Cases.
- (2) Advanced Cardiac Disease.
- (3) Arterio-sclerosis.
- (4) Cases with Fever and Toxæmia.

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NOTES ON HILL STATIONS

Hill Stations and Health Resorts	Altitude Ft.	Rainfall In.	Mean Temp. Degrees	Prevailing Winds	Humi- dity
Almora ...	5,494	42.40	...	...	...
Aijal (Lushai Hills).	3,700	...	...	...	...
Bhim Tal ...	...	...	...	...	...
Bangalore ...	3,021	85.10	74.8	{ S84°W* S89°W	68* 78 }
Coonoor ...	6,000	66.64	60	...	...
Cox's Bazar ...	...	...	...	...	...
Darjeeling ...	7,482	125.44	58.1	{ S75°W* S81°E	86* 85 }
Dalhousie ...	7,687	88.99	...	...	...
Dehra Dun ...	2,288	88.66	70.1	{ S83°W* S6°E	64* 70 }
Dras ...	10,059	21.22	86.1	N78°W	77

* In the case of winds, the values in bold figures are derived from 10 and only.

AND HEALTH RESORTS

REMARKS

Has a great reputation as a resort for cases of tuberculosis of the lungs, and people flock there from all parts of India. It has a low rainfall. From Kathgodam, the terminus of the R. and K.R., there is a lorry and motor car service *via* Raniket: by the former the journey takes 9 and by the latter 6 hours. The accommodation for Europeans is very limited, and many of the Indian houses are said to be badly infected with tubercle. Rocky soil, good natural drainage, little vegetation. Season—April to October.

Distance, 480 miles from Calcutta to Silchar by rail, and 111 miles by road from Silchar. Journey from Silchar (a) by road—111 miles, 8 marches; furnished Inspection Bungalow at each stage; (b) by boat—country boats can be obtained from the government contractor of Silchar and Aijal or by direct arrangement with the Superintendent, Lushai Hills.

9 Miles from Kathgodam, the terminus of the R. and K.R. There is ample hotel and boarding-house accommodation, lake fishing and shooting. The unenviable reputation, as regards sanitation and fever, which the place had a few years ago, has now been rectified. Season—April to October.

Very healthy, with a low death-rate, and cool, pleasant climate. Many European pensioners retire there.

The Pasteur Institute of Southern India. It is 22 miles from Mettupalayam and 10 miles from Ootacamund. The annual mean temperature is 60° with an extreme Variation not exceeding 15° either way. Flowers, fruits, and vegetables grow in profusion all the year round. Rainfall is well distributed throughout the year, but heaviest in the north-east Monsoon.

A subdivision in the district of Chittagong, is a well-known health resort. The surrounding country is hilly and very picturesque and good shooting is obtainable in the neighbourhood. A great attraction is the excellent sea-bathing obtainable on a fine sandy beach. The Dak Bungalow is situated on a small hill overlooking and about five minutes' walk from the Sea.

Very damp, with a rainfall of 125 inches, principally from June to September.

A very pretty, moderately sized hill station, built on three separate hills, but rather difficult of access. Season—May to October.

Has a large population of retired Europeans and Anglo-Indians. It is a very pretty station, and only 14 miles from Mussoorie. At the X-rays Institute, patients can obtain all kinds of electrical treatment. Soil rocky. Season—October to March.

At the Ladak end of the Zoji la Pass. The only accommodation is a Dak Bungalow. Season—June to September.

16 hours' observations, and those in plain figures, from the 8 hours' record

NOTES ON HILL STATIONS

Hill Stations and Health Resorts	Altitude Ft.	Rainfall In.	Mean Temp. Degrees	Prevailing Winds	Humi- dity
Gulmarg ...	8,500	...	...	...	...
Hazaribagh ...	2,000	...	...	...	...
Jubbulpore ...	1,827	55.01	76.5	{ N68°W* S83°W }	60* 67 }
Kasauli ...	6,835	60.40	...	...	...
Kodaikanal ...	7,688	62.19	57.9	{ N9°W* N6°W }	60
Lansdowne ...	6,000	...	...	...	...
Leh ...	11,503	3.21	42.5	{ S84°W* S60°W }	51* 51 }
Murree ...	7,507	59.00	57.7	{ S88°E* N84°E }	57* 56 }
Mount Abu ...	3,945	50	60	{ S89°W* S87°W }	68* 54 }
Mussoorie ...	6,705	94.80	57.1	N12°E*	65
Maymya ...	3,545	60.20	66.5	S43°W	84
Naini Tal ...	6,400	96.47	...	...	...

* In the case of winds, the values in bold figures are derived from 10 and only.

AND HEALTH RESORTS

REMARKS

This is one of the prettiest and most enjoyable hill stations in India; 26 miles by motor from Srinagar and 2 miles up the hill by pony or dandy, bring the visitor on to a large marg with two 18-hole golf courses, a first-class polo and gymkhana ground, and several tennis courts. Accommodation either in the large hotel (Nedou's) or in numerous electrically-lighted wooden huts is good. Huts vary from Rs. 500 to Rs. 1,500 for the season. The Season is from June to the middle of September. The high altitude some people find trying.

A sanatorium in Chota Nagpur. The town is surrounded by hills and there are some fine lakes in the vicinity. The roads both in and outside the town are in good condition and suitable for motor cars.

Cases sent here from the eastern districts of the U.P. have benefited considerably. Kankar soil.

The Pasteur Institute of India. Good natural drainage. Season—April to October.

On a plateau of the Pulney hills, a spur of the Ghats, in the Madura district of Madras. Much resorted to by Europeans throughout the year. Climate is cool and bracing. Noted for its remarkably dry gravelly soil.

Is a military cantonment situated in the district of Garhwal, about halfway between Mussoorie and Naini Tal.

Leh and the whole of Ladak are an excellent climate for early cases of pulmonary tubercle. Season—End of May to October.

The houses crown the summit and sides of an irregular ridge. An admirable climate, very suitable for children.

One hour by motor from the railway. Sanatorium for Rajputana and a celebrated place of pilgrimage. 17 miles from Abu Road on the B.B. & C.I. Railway. The climate is very healthy and delightfully cool—like the best in Switzerland.

Easy of access, being only 14 miles from the railway by motor road. There are many excellent hotels and nursing homes. Massage and electric treatment are obtainable.

A plateau in the Mandalay District of Burma.

About 21 miles by motor, or 18 miles by motor and 3 miles by dandy or pony. The station is cup-shaped, the houses being built on the sides from the edge of the lake; and unless accommodation can be obtained near the top, it cannot be said to be healthy. The rainfall is heavy, and the southern side of the station is enveloped in heavy mist during the rains. The Ramsay Hospital for Europeans is one of the best in India, and, in addition to accommodation for about thirty patients of all classes, has a large maternity block. Season—April to October.

16 hours' observations, and those in plain figures, from the 8 hours' record

NOTES ON HILL STATIONS

Hill Stations and Health Resorts	Altitude Ft.	Rainfall In.	Mean Temp. Degrees	Prevailing Winds	Humi- dity
Nuwara Eliya (Ceylon).	6,210	98.9	59	...	88
Ootacamund	7,327	56.46	57.3	{ N72°E* S18°E* }	68
Puri (Orissa)	24	54.00	80.4	N77°W	83
Pachmarhi ...	3,528	75.75	70.4	{ N63°W* S81°W }	60* 60 }
Panchgari ...	...	...	...	...	...
Quetta ...	5,502	10.02	58.9	{ N75°W* S15°W }	51* 58 }
Ranikhet ...	6,069	52.15	60.8	{ S84°W* S72°W }	65* 67 }
Ranchi ...	2,128	56.20	74.9	S78°W	66
Shillong ...	4,920	86.05	61.7	S9°W	74
Simla ...	7,232	63.07	55.3	{ N1°E* N44°E }	61* 57 }
Sonamarg ...	8,764	73.55	...	...	...

* In the case of winds, the values in bold figures are derived from 10 and only.

AND HEALTH RESORTS

REMARKS

A good health resort for those on short leave from India.

Chief sanatorium of the Madras Presidency. Stands on a plateau in the Nilgiri Hills protected on the North-East and South. The gardens are luxuriant, and there are extensive carriage drives, 82 miles from Metapolium on the Madras Railway.

A popular health resort with good sea-bathing. It is easily reached from Calcutta by the Madras Mail, being only a night's journey. There are several hotels, the principal being Seaside Hotel, the Sanatorium Beach Hotel, Ocean Villas and Ashworth Villas Hotels. Accommodation for patients should be secured beforehand, as the number of visitors, especially during the holidays, is very large. There is a good sea breeze all the year round, but the humidity is high.

A table-land in the Hoshangabad district and is the Sanatorium of the Central Provinces.

29 miles from Wathar Station on the S.M. Railway, journey by motor car from Wathar. Owing to the purity and exhilarating effect of the climate, it is a favourite resort in Summer, specially for the Bombay people.

Has a severe winter and suffers from blizzards. Dust-storms are frequent in the summer months.

52 miles from Kathgodam by motor, this station has the advantage of being more or less on the flat, so that horse conveyances and motors can be used. There is a good golf course and extensive pine woods. Season—April to October.

Much used as a health resort by Europeans in the cold weather months. The new asylum for European patients is 7 miles from the station.

On a plateau in the Khasi Hills, 67 miles by road from Gauhati.

The Walker Hospital for Europeans and the Ripon for Indian patients. There are several very good hotels, and electric treatment is obtainable. Mashobra and Wild-flower Hall, about 6 miles from Simla, have excellent hotel accommodation and good pine forests. The latter, which is 1,000 feet higher than Simla, is to be strongly recommended for invalids. Season—April or May to October.

Is four marches from Srinagar up the magnificent Sind Valley, but not so bracing or beautiful as Batlial, nine miles further on at the foot of the Zoji la Pass. Patients must take tents as the bungalow is small. Season—June to September.

16 hours' observations, and those in plain figures, from the 8 hours' record

NOTES ON HILL STATIONS

Hill Stations and Health Resorts	Altitude Ft.	Rainfall In.	Mean Temp. Degrees	Prevailing Winds	Humi- dity
Srinagar ...	5,204	20.47	55.1	{ N18°W* S42°E	80* 80 }
Wellington ...	6,200	50.11	62.0	{ S18°E* S45°W	72† 68 }

* In the case of winds, *the values in bold figures* are derived from 10 and only.

† In the case of humidity, *the figures in bold* are true daily means, and

AND HEALTH RESORTS

REMARKS

196 miles from Rawalpindi by motor, is very warm in the months of June, July, and August, and during the winter months is very sunless. The accommodation is principally in house-boats moored along the banks of the Jhelum and its backwaters. These boats for the most part are well furnished and lighted with electric light. There is a cottage hospital for the accommodation of Europeans, and a large Mission Hospital for the treatment of Indians. Season—Divided into two parts, first at Srinagar, April to June, and then September to November, the remaining months, June to September, being spent at Gulmarg, 9,000 ft. above sea-level, an ideal Summer resort.

Sanatorium and cantonment 9 miles from Ootacamund in the Nilgiri district, Madras.

16 hours' observations, and those in plain figures, from the 8 hours' record those in plain figures are the mean of 8 hours' readings only.

For early cases of pulmonary tubercle, if the patient cannot leave India, a house-boat at Gunderbal, 14 miles from Srinagar, is recommended until about 20th May, when the patient should march up the Sind Valley and cross the Zoji la Pass into Ladak, until the end of September or first week of October. The rainfall of Ladak is only about 2 inches per annum, and the dry bracing air is wonderfully beneficial but only very early cases should attempt this journey, as no medical assistance is obtainable except at Leh, 248 miles from Srinagar.

Patients suffering from neurasthenia, nervous, and heart diseases, should not attempt Kashmere; as, apart from difficulties of transport, the endless annoyances due to lack of efficient supervision and control would more than counterbalance the good of this excellent climate.

For children in Northern India, Kashmere is certainly the best climate; next, Mussoorie, Simla, Murree or Dalhousie; Naini Tal is not so bracing.

HYDROTHERAPY

Water as a therapeutic agent may be employed externally, either as ice or in liquid or vapour form; it is applied at varying degrees of temperature, either alone or impregnated with other substances. While many complicated methods of application can only be carried out when a complete hydrotherapeutic apparatus is available for heating and cooling the water, the essential principles of the cold bath and wet pack, indispensable in the treatment of the many cases of enteric and heat-stroke, can be carried out in any Indian house, with the aid of a charpoy, a *mussack* of water and a sheet.

The following are the methods of application:—

BATHS

An ordinary bath is 30 gallons.

(a) TEMPERATURE OF BATHS.—

			F.	C.
Cold Bath	...	...	40° to 65°	4.4° to 18.8°
Cool Bath	...	...	65° to 75°	18.8° to 23.8°
Tepid Bath	...	...	85° to 95°	29.4° to 35°
Warm Bath	...	...	95° to 100°	35° to 37.7°
Hot Bath	...	...	100° to 110°	37.7° to 48.8°
Very Hot Bath	...	...	110° to 120°	48.3° to 48.8°

(b) VAPOUR BATHS.—

			F.	C.
Warm Vapour Baths	...	...	100° to 115°	37.7° to 46.1°
Hot Vapour Baths	...	...	115° to 140°	46.1° to 60°

A vapour bath may be improvised by placing in the bed a few strong bottles filled with nearly boiling water, tightly corked down, and wrapped in pieces of flannel wrung out of hot water. The patient should be well covered, and the bottles should be placed round him, in the bed.

(c) CONTINUOUS BATHS.—

WARM BATH.—The patient, having his head covered with a cold cloth, lies fully immersed in water at 95° to 100° F.; it is useful in severe skin eruptions like pemphigus, and in nerve lesions, such as paraplegia, locomotor ataxia, and hemiplegic contractures, sciatica, muscular, and articular rheumatism. The continuous water bath is also of great value in the daily treat-

ment of mania, in that it raises the previously pathologically low blood pressure, and leads to great amelioration of symptoms.

(d) **TURKISH BATH.**—The patient, after drinking water freely, enters a room with dry air at 110° to 130° F.; when perspiring freely, he enters another room at 150° to 200° F. for a few minutes, during which time he is rubbed vigorously with bare hands. A cold douche at 60° F. is then given, followed by a cold plunge in water at 60° F. He then lies down until the skin is dry and the pulse normal. Finally, he is rubbed with alcohol, and allowed to rest.

(e) **MEDICATED BATHS.**—

- (1) **ALKALINE BATH.**—Sod. Carbonate, $\frac{1}{2}$ oz. to every gallon of water.
- (2) **ACID BORIC BATH.**—Boric Acid, 2 oz. to every gallon of hot water.
- (3) **SULPHUR BATH.**—Potassium Sulphide, $\frac{1}{2}$ oz. to every gallon of water.
- (4) **SALT BATH.**—Sod. Chloride or Sea Salt, 4 to 8 oz. to every gallon of water.
- (5) **MUSTARD BATH.**—Mustard, $\frac{1}{2}$ to 1 oz. to every gallon of water, as hot as can be borne. Rub the mustard to a smooth paste with cold water, before adding it to the hot water.
- (6) **ACID BATH.**—Nitro-Hydrochloric Acid Dilute, 14 $\frac{1}{2}$ oz. to 30 gallons of water.
- (7) **BRAN BATH.**—Wheaten Bran, 64 oz. to 30 gallons of water.

PACKS

(a) **COLD WET PACK.**—The patient, quite naked, with the arms extended lies on a sheet wrung out of very cold water. The sheet on one side is wrapped over the body and limbs, the hands are brought to the sides, and the other half of the sheet covers in both arms and legs. A hot bottle is applied to the feet, which are not covered by the sheet, and a cold compress to the head. The patient is now well covered with blankets, closely adjusted round the neck, so as to exclude all air.

(b) **HOT WET PACK.**—This is done in the same way as above, with hot instead of cold water. It is useful in infantile convulsions, and bronchitis in children, and very valuable in uræmia, chronic parenchymatous nephritis with anasarca and eclampsia.

(c) **THE DRIP SHEET.**—The patient stands in a tub with water at 100°, wrapped in a sheet soaked in water at 75°. A basin of water at 65° is poured over the head and shoulders at short intervals, friction and slapping are kept up by the nurse for 5 or 10 minutes. The sheet is then removed, the patient dried with warm towels, dresses and takes light exercise. Useful in anæmics, neurasthenics, and all cases requiring stimulation, when the patient is not too feeble to react.

SPONGING

Take the patient's exact temperature, remove all clothing, and place one blanket under, and another over the patient, with a hot bottle at his feet.

First sponge the face and neck with tepid water 80° to 90° F. Always sponge downwards, exposing only the part being sponged. On reaching the feet, begin again at the head. After the whole body has been sufficiently sponged, dry lightly, cover with a light warm blanket and leave undisturbed for an hour. Take the patient's temperature immediately after sponging, and again after the hour's rest. Sponging usually causes a reduction in temperature of one to four degrees F. In stronger patients, the water may be used at 60° F., or the arms, back, and chest may be allowed to dry by evaporation. Cooling by rapid evaporation is favoured by the addition of Vinegar, Eau-de-Cologne or Ammonia to the water.

Sponging is beneficial in febrile conditions, especially typhoid fever. A cold abdominal compress is sometimes applied, to enhance the effect of the sponging. It is important to bear in mind the danger of collapse during this procedure.

COMPRESSES

(a) **COLD COMPRESS.**—Linen is partly wrung out of water at 50° to 60° F. laid evenly over the affected part, and covered with a flannel binder, several layers thick, to prevent radiation. The compress is renewed every hour. This is very useful at the onset of pneumonia, and can be used to relieve the pain of appendicitis and peritonitis due to perforation while preparations are being made for operation.

(b) **ICE COMPRESS.**—This is best applied in the form of an icebag.

(c) **HOT COMPRESS (FOMENTATIONS).**—Several thicknesses of flannel or lint should be boiled for five minutes, wrung out as dry as possible, and then applied beneath oil-silk and wool. If applied wet, the skin becomes sodden and is

frequently scalded. Hot Compresses hasten suppuration, relieve the pain of arthritis, sprains, lumbago, and neuralgia, and are useful in the treatment of bruises, cramps, hepatic and renal colic.

DOUCHES

There are many kinds, classified according to the part of the body treated, as head, spinal, or perineal douches; or according to the temperature of the water, as hot, tepid, or cold; or according to the form of the stream of water, as needle, spray, rain, and fan, under greater or less pressure.

Douches are useful in treating limited parts of the body.

AFFUSIONS

The patient, stripped naked, has basins of very cold water, dashed at him from a height or distance of several feet. This is strongly stimulating.

MASSAGE

Massage and allied methods of treatment are described in the oldest Hindu and Chinese books. It is an excellent therapeutic measure, and its range of usefulness has been greatly extended during recent years. But there are conditions in which it cannot be used with benefit to the patient, and cases come under one of two heads:—

1. When stimulating massage is administered to a patient, who is physically and mentally tired out, and therefore unable to react to the treatment.

2. The misuse of massage, whereby a mechanical treatment of a muscle is expected to produce results that can only be ultimately achieved by voluntary contraction or re-education of that muscle.

THE GENERAL PRINCIPLES OF MASSAGE

Attention to detail is of first importance, and the position of the patient and massour may make the difference between success and failure. There must be a reason for every movement and position. There are two possible effects of any massage manipulation, *viz.* (1) Reflex and (2) Mechanical, and these are of equal importance.

1. REFLEX.—Examples of Reflex action are the stimulation of peristalsis, the relief of muscular spasm in fractures, and the production of sleep in the insomnia of the neurasthenic.

2. MECHANICAL ACTION.—Examples are:—

- (1) By assisting the absorption of inflammatory and effete products.

- (2) Acceleration of the lymph flow.

- (3) Tension on structures which it is desired to stretch or free.

- (4) Restoration of tone to muscles weakened by disuse or disease.

- (5) The effect of direct pressure on the abdominal organs.

THE MANIPULATIONS OF MASSAGE

The following manipulations are all more or less employed whenever massage is performed:—

1. STROKING OR EFFLEURAGE.—This is applied to all stroking movements. The part to be massaged is stroked firmly and slowly in the direction of the venous flow; usually,

it is carried out with the ulnar edge of the hand, but one finger or the whole palm may be used.

In all cases, the treatment should begin and end with this movement. This method is of the greatest value in eliminating spasm, owing to the rhythmic, painless stimuli which constantly impinge upon the same area of the central nervous system as that which is concerned in the motor irritative phenomena. For instance, many cases of Colles' fracture may be reduced with the minimum of effort and pain if effleurage has been practised twenty minutes previously.

2. KNEADING OR PETRISSAGE.—This consists of five movements, namely, (1) Kneading, (2) Rolling, (3) Ironing, (4) Picking up, and (5) Friction.

It is used to imitate the normal muscular action: the muscles are drawn away from the bones and from each other. This is the most difficult to learn. It consists of grasping the skin or muscle to be massaged and kneading, alternately tightening and loosening the hold, from the periphery towards the centre of the body. It is desirable to use both hands at a time for larger muscles, but neither the skin nor the hairs must be dragged on so as to cause pain. Sometimes, as in the arm, it is possible with one hand to work on the muscles on one side, and with the other hand to work them on the other side, and at the same time, to press and roll the opposite muscles together or against the bone.

3. RUBBING OR FRICTION.—This consists in rubbing rapidly in small circles, from the periphery of the body, towards the centre, with the finger-tips or the whole hand. It is used chiefly over nerve roots or near bones, to stimulate nerves and to break down superficial adhesions.

4. PERCUSSION OR TAPOTMENT.—This includes four movements, *viz.* (a) Hacking, (b) Pounding, (c) Clapping, (d) Flicking, a complicated rotary movement which requires great practice. These movements have the opposite effect to effleurage and act principally on the nerve trunks. They consist of striking a number of blows in quick succession, either with the tips of the fingers, or the edge of the hand, or the whole hand. When the finger-tips are used, the blow should be delivered from the wrist; this stimulates the skin, but when stimulation of muscles is required, the blows should be made in a chopping manner, with the edge of the hand, in series, along the length of the muscle, transverse to its long axis. Various mechanical devices are occasionally used to strike a number of rapid blows. To carry out these movements efficiently, considerable manual strength and delicate touch are necessary.

As an example of massage of a part, we may take the lower extremity. If the hair be long, it should be cut close; then, beginning at the toes, the foot may be stroked several times with the ulnar edge of the hand, on both dorsum and sole; the same should be done to the leg, from the ankle to the knee, and the thigh, from knee to the hip. For these larger parts, it may be well to use the whole hand. If we recollect the arrangement of the valves, it is easy to see that the desired object of aiding the flow in the superficial veins will be attained by this stroking, which must always be in the direction of the venous flow; if there be a difficulty in accomplishing this, as in the back, the stroking should be in a uniform direction. Again, beginning at the toes and working upwards, a fold of skin should be pinched up between the thumb and forefinger, and lightly kneaded so as to give no pain, and the whole skin of the limb should be treated in this way; the beneficial effect in aiding the cutaneous circulation is at once seen in the redness produced, both the hands may be employed, one following the other. After this, the muscles are to be grasped between the thumb and fingers, or, if it be more convenient, between the fingers of the two hands, and thoroughly kneaded from below upwards, the aim being to accelerate the flow of lymph and blood in them. Next, the limb may be rubbed in small circles, from below upwards, in the manner already described, after which percussion may be applied also from below upwards; and lastly, passive movements should be made of all the joints, such as the toes, ankles, knees, hips, partly for the same object as that for which the muscles are kneaded, and partly to aid the absorption of any fluid there may be in them.

Bear in mind that—

- (1) Pain must never be produced by massage.
- (2) Always massage in the direction of venous return.

Violent rubbing and manipulation by professional wrestlers and other muscular persons, is strongly condemned, as the writer has frequently seen the most serious consequences. Energetic rubbing in of mustard and other non-sterile oils with unwashed hands, often leads to extensive abscesses.

CONDITIONS IN WHICH TREATMENT BY MASSAGE IS ESPECIALLY BENEFICIAL

SURGICAL CONDITIONS

1. RECENT INJURY.—By firmly holding the part, clotting takes place in the injured vessels and so prevents further effusion. With the other hand, effusion, which has already taken

place, is completely removed in a few minutes, and the part is then firmly bandaged over several thicknesses of cotton wool. But massage, in this case, is only a preliminary to mobilization.

2. FRACTURES.—The object is to maintain the nutrition of the part and mobility of the joint, and to prevent muscular weakness and œdema.

Friction, directly over the line of fracture, must be avoided until union is complete; otherwise, it may lead to excessive formation of callus. Increased tenderness at the site of the fracture indicates irritability of the callus, due to strain and mobilization, must at once be stopped. Special care must always be taken to firmly support the ends of the broken bones. Sudden onset of pain and œdema is probably due to thrombosis, and treatment must be immediately suspended.

3. DISLOCATION.—It is remarkable the ease with which many dislocations can be reduced after massage has been carried out for a short time. The old method of treatment after reduction was prolonged rest and complete fixation. This led to impaired circulation in the parts and so diminished the repair of the injured ligaments, and the rapid wasting of the muscles controlling the joint. At the present day, dislocations are frequently treated with mobilization and massage from the time reduction has been accomplished.

Effleurage is given for the first four to seven days until the inflammation has subsided. Later petrissage, and finally vigorous massage for fifteen minutes at the end of a fortnight.

4. SPRAINS.—Effleurage twice a day until all effusion has disappeared. Then the whole surface of the muscles which move the joint should be dealt with, with effleurage over the injury. Petrissage is used as soon as it can be given without pain. The treatment is usually continued for about three weeks.

5. AFTER-EFFECTS OF INJURY.—Such as loss of muscular power, scars, adhesion and stiff joints. Much depends, in these cases, as to whether the case has been complicated with sepsis. If so, the treatment will be greatly prolonged and the prognosis less favourable. In dealing with a recently healed scar, no movement must be made which tends to separate the edges, until after a period of three to four weeks.

Stroking becomes firmer and firmer, followed by compression movements, and a mechanical vibrator is often helpful in these cases.

In dealing with stiff joints, the parts above the articulation must first be thoroughly rubbed, then all movements that are

useful for stretching and breaking down adhesions over the stiff parts.

6. DEFORMITIES.—In the treatment of deformity, massage is an accessory: it may be used to improve the nutrition of the part, before operation by the orthopædic surgeon; but after operation, restoration of function will depend on exercise, and exercise alone.

MEDICAL CONDITIONS

1. CARDIAC DISTASTE.—Massage can be of use in cardiac cases by securing its marked sedative effect, by relieving insomnia, restlessness and distress, by aiding the elimination of waste products from muscles and so giving the heart muscle a purer blood supply; and any holding up of the venous circulation is removed, thus helping the arterial circulation. Treatment is usually applied by effleurage and slow rhythmical petrissage to the limbs, treatment being stopped if there are any signs of distress.

2. CONSTIPATION.—Before treatment is commenced, the case must be carefully studied as the constipation may be the result of a malignant growth, the formation of a bad habit, defects in diet, or lack of sufficient fluid, the last is a frequent cause in the tropics. Abdominal massage deep over the colon, and working in the direction taken by the contents of the bowel. A combination of kneading and percussion rarely fails to cure cases of chronic constipation in the course of a few weeks.

3. NEURASTHENIA, HYSTERIA.—The fatigue, depression and irritability of the neurasthenic are to be met by only the most careful handling.

MINOR OPERATIONS AND OTHER THERAPEUTIC MEASURES

- I. BIER'S PASSIVE HYPERÆMIA.
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I. BIER'S PASSIVE HYPERÆMIA

Bier's idea was to treat infected tissues, especially joints, by deliberately producing hyperæmia, which is the principal phenomenon of inflammation. The success of this method of treatment is believed to depend upon the coincident working of bacteriolysis and phagocytosis. By increasing the pressure in the capillaries, the focus of infection is flooded with lymph, having antitryptic and opsonic powers, arresting the further destructive action of ferments and inhibiting bacterial growth. When the pressure is removed, the lymph moves out of the affected part and exerts an influence upon the bactericidal power of the blood generally, by the stimulation of antitoxins, opsonins, alexins, etc.

Methods of application:—

- (1) By an elastic bandage applied to an extremity.
- (2) By vacuum chambers, into which part of the limb is introduced.
- (3) By the use of Klapp's suction balls similar in action to the ordinary dry-cupping.

The Cup method is the most generally useful. Cups are made to fit any part of the body, and are of various shapes and curves. The cup consists of a glass bowl with a heavy curved rim, with bulb attachment for exhausting the air. Care must be taken that the diameter of the cups exceeds the area of infiltration, and that the amount of pressure is carefully regulated; because, if the vacuum is too little, nothing is attained, and if too great, pain and white cedema are produced. The rim of the cup is greased with vaseline, and while the bulb is compressed with the right hand, the cup is applied over the carbuncle or sinus, and the pressure slowly released. The skin and underlying tissues are sucked into the cup, hyperæmia appears as a red or bluish colouration, while pus, serum and blood ooze from the wound. After five minutes the cup is removed, the discharge wiped away, and the part allowed to rest for three minutes, whereupon the cup is again applied. This intermittent treatment is continued for about forty-five minutes daily, the period being gradually diminished as the discharge becomes thinner, and the granulations more healthy, a simple dressing is applied after each application.

The elastic bandage is made of soft rubber, $2\frac{1}{2}$ inches wide, and sufficiently long to be wrapped six to eight times around the limb, as far above the affected area as possible. The bandage should be sufficiently tight to hinder the venous return; but not to diminish the arterial pulse or cause pain or coldness of the part. In a few minutes, the limb becomes swollen, and of a deep-red or purple colour up to the bandage, which remains on from one to twenty-two hours, according to the condition under treatment; but the position of the bandage should be changed after it has remained ten hours in one place.

Bier's method has been used for the treatment of a great number of conditions. Its principal use is in the treatment of sinuses, fistule, septic wounds, abscesses, carbuncles, buboes, and chronic inflammation of the joints.

II. BLISTERS

Cantharidis is used, either in the form of a plaster (*Emplastrum Calefaciens*) (B.P.) or in solution in Collodion (*Collodium Vesicans*) (B.P.).

The application should not exceed one inch in diameter, applied to the carefully cleansed skin. It remains on from four to eight hours, according to the effect desired, and is removed by carefully detaching and elevating the sides. The blister is then punctured, the serum drained off, and the surface protected by a dressing of sterile gauze. If, at the end of eight hours,

vesication has not occurred, a hot fomentation will produce the exudation. The skin should never be clipped away.

' Flying Blistering ' is blistering that is continually repeated.

III. CARBONIC ACID SNOW

This is a very efficient and useful therapeutic agent, with the following advantages:—

- (1) It is cheap and easily obtained from a carbon dioxide cylinder used for making aerated water.
- (2) It can be easily collected and moulded to the required shape.
- (3) Its temperature remains constant, and its action is under perfect control, by the period of its application from 10 to 60 seconds, and to a less degree, the amount of pressure during contact.
- (4) There is little pain or discomfort.
- (5) Success is the rule and failures are rare.

The following conditions are suitable for this treatment:—

Warts.	Trachoma.
Corns.	Lupus.
Moles.	Urethral Caruncle.
Rodent, when it does not involve bone.	
Nævi, cavernous, capillary, and port wine marks.	

IV. COLD

Cold may be applied by means of a bath, compresses, pack, sponging, coils or ice.

THE ICE-BAG is the most effectual way to apply cold continuously, and is made in all sizes and shapes, for application to the head, throat, chest and abdomen.

The bag should never be more than half full, and should not be placed directly on the skin, but always have a layer of lint between. The cold may be increased by adding salt to the ice. The Ice-bag should not be used when the vitality of the tissues is low or in purpuric affections. It is especially useful for injuries to the head, application to the thyroid in exophthalmic goitre, to quiet the heart in tachycardia, and to relieve the pain of appendicitis during the preparation for operation.

V. CUPPING

Cupping is used for the relief of inflammation by drawing blood away from the inflamed area. There are two kinds:—

(1) **DRY CUPPING.**—In this the blood is only drawn to the surface, acting as a counter-irritant.

(2) **WET CUPPING.**—The blood is drawn from the body, acting as a counter-irritant and depletant.

The skin is washed and dried before application.

DRY CUPPING.—The edge of a small thick glass is smeared with vaseline, a small piece of blotting paper, soaked in methylated spirit, is lighted inside the glass, which is then inverted, and firmly placed over the part to be cupped. On account of a partial vacuum being formed, the soft tissues are drawn into the glass and become deeply congested. To remove the glass, press the finger under the edge, when the air rushes in.

WET CUPPING.—This is done in exactly the same way, except that the skin is scarified just before the cut is applied. As much blood may be withdrawn as desired.

VI. EXPLORATORY PUNCTURE OR PARACENTESIS.

In the first six of the following cases, puncture should be preceded by the injection of a local anæsthetic at the site selected. It is essential that the drug should be injected intradermically as well as subcutaneously, if analgesia is to be produced.

1. ABDOMEN

THE SITE.—Is usually a point in the linea alba, midway between the umbilicus and the pubes, but the punctures may be at a point in the linea semilunaris, just outside the rectus muscle, on a line midway between the umbilicus and anterior superior spine. Should repeated punctures be necessary, it is advisable to change the site a little each time.

POSITION OF PATIENT.—If possible, sitting upright on the edge of the bed, or in a semi-recumbent position; when made through the linea semilunaris, the patient should lie upon the side.

QUANTITY WITHDRAWN.—Will depend upon the condition of the patient, and the way in which he bears the operation. Generally, there is no harm in removing all the fluid, provided it is not done too rapidly.

2. PLEURAL CAVITY

THE SITE.—The needle must be inserted at the point where the physical signs, or an exploratory puncture, show the presence of fluid, and at the lowest level of the fluid, in order that the withdrawal may be facilitated, as far as possible, by gravity. The sixth intercostal space in the anterior axillary line, the sixth or seventh space in the mid-axillary line, and the eighth space below the angle of the scapula, are the points of election.

POSITION OF THE PATIENT.—On a bed, to avoid any exertion of moving after the operation; when possible, in an upright sitting position. The hand of the affected side should be raised, and placed on the opposite shoulder, to increase the breadth between the intercostal spaces.

QUANTITY WITHDRAWN.—If there are definite indications for the aspiration of fluid from the pleural cavity, the following precautions must be closely observed:—

- (1) The fluid must be withdrawn slowly.
- (2) If the patient experience sharp pain, or
- (3) If cough develop, the process must be stopped at once. Failing this precaution, there is danger of the supervention of acute pulmonary oedema.
- (4) In cases where it is necessary to 'needle' close to the root of the lung, $\frac{1}{100}$ gr. atropine and $\frac{1}{200}$ gr. scopolamine should be given $\frac{1}{2}$ hour previously, to diminish the risk of vagal inhibition of the heart.
- (5) It is seldom necessary to withdraw more than a pint of fluid: the subsequent return of respiratory movement to the affected side will assist in the absorption of the remainder.

3. PERICARDIUM

THE SITE.—The needle, which should be fine, is inserted between the outer limits of cardiac dullness and the apex beat. This is the safest place.

POSITION OF THE PATIENT.—Lying on a bed.

QUANTITY WITHDRAWN.—All the fluid obtainable.

4. LIVER

THE SITE.—Will depend upon the symptoms and physical signs in each case. If at one point there be distinct bulging,

localized pain, or tenderness on palpation, puncture should be made there. In the absence of localizing signs, it should be remembered that most abscesses are in the upper posterior portion of the right lobe, and the needle is then inserted in the mid-axillary line, through the 9th, 10th, or 11th interspace, or below the angle of the scapula through the 10th interspace. Puncture can also be made anteriorly, into the area of liver dullness, below the line of the pleura.

5. SPLEEN

THE SITE.—The needle is inserted through the 10th intercostal space, on the left side, or if the organ is considerably enlarged, a point below the left costal margin over which there is splenic dullness.

POSITION OF THE PATIENT.—Either recumbent or sitting with the arm raised, and the hand on the opposite shoulder, whichever gives the best access.

6. BLADDER

For temporary relief, an aspirating needle and syringe may be used. Potain's Aspirator is the best. The puncture is made in the middle line, about half an inch above the pubes. The extra-peritoneal space is increased when the bladder is distended, and a trocar can be inserted here without danger of wounding the peritoneum.

7. TUNICA VAGINALIS

See Hydrocele.

VII. GASTRIC LAVAGE

Gastric Lavage or washing out the stomach is indicated in cases of poisoning, in gastric disturbance in children, in the various conditions of chronic gastritis, to remove fermented food and excessive secretion of mucus; for persistent post-operative vomiting; and for the fecal vomiting of intestinal obstruction, and peritonitis.

The tube should be of soft red rubber, 30 inches long, with a solid end and two or three lateral openings. The tube should be connected, by a glass junction, to another piece of tubing about 30 inches long, attached to a rubber funnel. A tube that is weak or cracked should never be passed.

Attention to the following details will lessen the discomfort to the patient: Artificial teeth should be removed. If the

tube is passed in a sitting position, the head should be slightly flexed; the tongue should never be depressed, as this causes the patient to involuntarily hold his breath or to vomit. The tube wet with water—never greased—is introduced into the posterior pharynx, and the patient instructed to swallow, at the same time breathing deeply and regularly. In children, the patient is held by a towel passing round the body, holding the arms down, the mouth being opened with a gag. A soft rubber catheter is used as the stomach tube.

PASSAGE OF AN ŒSOPHAGEAL BOUGIE.—The above points also apply to the passage of an Œsophageal bougie, but before this is attempted, aneurysm of the aorta must be excluded, and if an obstruction is encountered, the greatest care used, as the commonest cause is carcinoma and this is easily penetrated.

VIII. GLUCOSE

Glucose is a valuable therapeutic agent in a large number of conditions. Given alternately with Sodium Bicarbonate by rectum, by mouth, or intravenously, it is the best treatment for Acidosis. In Hypoglycæmia due to over-dosage with insulin the symptoms are at once relieved; and it is also given in conjunction with insulin for the treatment of diabetic coma. It has been used with advantage in cyclical vomiting and asthma of children. It has also been used as an injection for varicose veins, as a surgical dressing, and is the best method of rectal feeding; given by the mouth it is a valuable food for patients with pyrexia or great debility as it requires no digestion before assimilation.

As regards uses before and after operations, the following summary is taken from the *Extra Pharmacopœia*:—

Always before a severe operation: (1) When liver efficiency is suspected; (2) When the metabolic rate is high; (3) When the patient is under-nourished or emaciated.

Always after a severe operation when blood transfusion is impossible.

After any anæsthetic: (1) Where the loss of blood has been considerable, and blood transfusion is impracticable; (2) In case of shock; (3) Where it has not been given before the anæsthetic; (4) Where there has been excessive disturbance of the tissues, or an unusually large amount of anæsthetic has been given; (5) Where there is a history of epilepsy.

ADMINISTRATION.—Intravenously it is given in a 7 per cent. solution. Subcutaneously: 4 to 5 per cent. solution up to 2 or 3 litres representing 90 to 210 grammes of Glucose. Per rectum: A 6 per cent. solution in tap water (525 grains to the pint); stronger solutions may be tried, but as a rule anything above 6 per cent. isotonic solution is retained with difficulty. It must not be given in normal saline as then being hypertonic it is absorbed with difficulty.

IX. HEAT

The range of Thermotherapy has been extended in recent years by the many forms of radiant heat applicators. It should be considered under the following heads: (1) Moist Heat, (2) Dry Heat, and (3) Radiant Heat.

(1) MOIST HEAT.—

POULTICES.—Are dirty, sticky and very septic applications, and should never be used for suppurating conditions. Where moist heat is desired, the antiseptic fomentation is far more satisfactory. The only exception is Kaoplasin (Collobell), which is made with the purest colloidal kaolin, containing 1 part in 4,000 of colloidal silver; it is ideal for the application of moist heat, and it is not only free from bacteria, but no micro-organism can grow on it. It comes away clean, but adhering particles can be removed with water.

FOMENTATION OR STUPE.—A small towel is placed across the bottom of a basin, four layers of thick flannel, or two layers of old blanket, are laid on the towel, and boiling water poured over the whole. The towel is now lifted up, and used as a wringer, by having the two ends twisted in opposite directions. The flannel is carried in the wringer to the patient and applied as hot as can be borne, the wet flannel being covered with four layers of dry flannel, cotton wool, oilskin or paper. The fomentation must be applied every ten or fifteen minutes, and in no case should it be left on until cold or clammy. It may be made antiseptic by the addition of Corrosive Sublimate 1 in 1,000, or Carbolic Acid 1 in 40.

TURPENTINE STUPE.—Is prepared by stirring half an ounce of turpentine into a pint of boiling water until emulsified.

Antiphlogistine—a proprietary preparation, expensive but effective. It contains Fuller's earth, glycerine and essential oils. It is heated by placing its container in a pot of boiling water, and so heated that it is applied at a temperature of 115°F. in

a layer a $\frac{1}{4}$ inch thick, and then covered with a pad of cotton wool. It should be reapplied in 24 hours. It has the disadvantage of interfering with the examination of the part.

The volcanic muds of Italy are useful and have the power of retaining heat for a remarkably long time.

VAPOUR BATHS.—The Russian bath is a chamber filled with steam at a temperature of about 120°F. in which the patient sits for about 20 minutes. The Berthe bath is a wooden box in which the patient sits, but with his head outside, the steam is at the same temperature. The Berthollet bath consists of a number of light metal cases, made to fit various parts of the body, the steam is admitted from a central cylinder.

(2) **DRY HEAT.**—This includes the Turkish bath and the Harrogate Hot-air bath. The Harrogate Hot-air bath consists of a number of cases adapted to particular parts of the body; inside the cases are a number of wires; the passage of a current through these wires produces a dry heat which may be as high as 500°F.

(3) **LUMINOUS RADIANT HEAT.**—The electric light bath is fitted with 20 to 30 incandescent lamps and a metal reflector. The patient sits in the bath completely naked; the time of exposure is about 12 minutes for a stimulating effect and about half an hour for diaphoresis, which is more readily induced than by any other method.

The Dowsing Radiant Heat Apparatus is only let on hire, and cannot be purchased. The heat can be given to any special part or the whole body, the temperature being accurately regulated up to 450°F.

BERGONIE BATH.—This consists of a full length cabinet, the patient's head being outside. Large electrodes are placed on the back, abdomen and thighs, and held in position by heavy sand-bags. A rhythmical faradic current causes contraction of the muscles against the weights, thus exercising them without fatigue, at the same time with free perspiration. It is used for the treatment of obesity. The Turkish bath on the other hand generally causes an actual increase in weight.

Radiant heat is especially useful in the treatment of chronic rheumatism, arthritis (infected or otherwise), gouty neuralgia and sciatica. The preliminary application of radiant heat to a joint that is to be manipulated is of great value, as it appears to soften the adhesions.

X. INJECTIONS

Hypodermic, Intramuscular and Intravenous with doses.

HYPODERMIC INJECTIONS.—

Aconitine Nitatis	...	...	1/600 gr.
Adrenalin	...	...	1 to 5 m shock; cardiac failure 30 m.
Apomorphine Hydrochlor.	...	...	1/20 to 1/10 gr.
Arsen. Iodide	...	...	1/60 to 1/20 gr.
Atropine Sulph.	...	...	1/150, 1/100, 1/60 gr.
Caisteine Sodio-Salicylas	...	...	1/2 to 2 gr.
Camphor	...	...	1 1/2 gr. in 1 c.c. sterile Olive Oil.
Cocaine Hydrochlor.	...	...	1/10 to 1/2 gr.
Codeme Phosphate	...	...	1/2 gr.
Colchicine Salicylate (Colchisal)	...	...	up to 1/32 gr.
Cotarnine Hydrochlor.	...	...	1/2 to 1/3 gr.
Digitaline	...	...	1/100 gr.
Emetine Hydrochloride	...	...	1/2, 1/3 or 1 gr.
Ergamine	...	...	1/65 gr.
Ergotina Citrate	...	...	1/200 to 1/100 gr.
Ergotoxine	...	...	1/100 gr.
Ether	...	...	30 to 60 m.
Eucaine Hydrochlor.	...	...	1/10 to 1/2 gr.
Eucaine Lactate	...	...	1/10 to 1/2 gr.
Heroin Hydrochlor.	...	...	1/25 to 1/3 gr.
Hydrarg. Perchlor.	...	...	1/60 to 1/30 gr.
Hyoscine Hydrobrom.	...	...	1/200 to 1/75 gr.
Hyoscyamine Sulph.	...	...	1/80 to 1/20 gr.
Iron and Aisenic—			
Ferri Citratis Viridis	...	...	1/2 to 2 gr.
Sodu Aisenatis Anhyd.	...	...	1/80 to 1/40 gr.
Morphine Hydrochlor.	...	...	1/2 to 1/3 gr.
Morphine Sulphas	...	...	1/2 to 1/3 gr.
Morphine Tartias	...	...	1/2 to 1/3 gr.
Nuclein	...	...	15 m of 5 per cent. solution.
Omnopon	...	...	1/2 to 1/3 gr.
Physostigmine Salicylate	...	...	1/100 gr.
Pilocarpine Nitras	...	...	1/20 to 1/4 gr.
Pituitary (Infundibular)	...	Extract)	
Infundi	...	...	0.5 c.c. and 1.0 c.c. capsules.
Potassium Permang.	...	...	1 to 3 gr.
Quinine Dihydrochlor.	...	...	1 to 5 gr.
Quinine Bisulphas	...	...	1 to 5 gr.
Quinine Hydrobrom.	...	...	1/2 to 2 gr.
Quinine Lactas	...	...	1 to 5 gr.
Scamin	...	...	1 to 3 gr.
Sodu Cacodyl	...	...	1/2 gr.
Sparteine Sulphas	...	...	1/2 gr.
Strophanthine	...	...	1/500 gr.
Strychnine Hydrochlor.	...	...	1/200 to 1/30 gr.
Strychnine Nitras	...	...	1/150 to 1/10 gr.
Strychnine Sulphas	...	...	1/150 to 1/30 gr.
Tinitrin	...	...	1/250 to 1/100 gr.

INTRAMUSCULAR INJECTIONS.—These are best made into the buttock, the patient may be standing, sitting or lying prone. The point selected for injection is important in order to avoid striking bone, or allowing the injection to come into

proximity with periosteum or nerves which might subsequently be the cause of obstinate pain or induration. The eye draws a visual line across the buttock horizontally at the level of the summit of the intergluteal fold, and a line at right angles from the posterior superior iliac spine to the top of the great trochanter. The best spot is just above the horizontal line and just in front of the oblique, *i.e.* above and in front of the point at which the lines bisect.

The skin having been sterilized with Iodine or Alcohol the left hand is placed horizontally across the buttock and draws the superficial tissues downwards. With a stabbing movement the needle is introduced to its full length; gentle traction is now made on the piston of the syringe for 15 seconds; this is necessary in case the point of the needle has entered a vein, as if an insoluble drug as bismuth or mercury was then injected pulmonary embolism might result. If any blood enters the syringe the needle must be withdrawn, and another attempt made a $\frac{1}{4}$ inch in front; then if no blood is aspirated and the point of the needle feels free the contents of the syringe are slowly injected.

The needle is withdrawn with a quick movement and the superficial tissues pushed up with the left hand, the object of this is to avoid leakage of the injection into the subcutaneous tissues with the possible formation of an abscess.

INTRAVENOUS INJECTION.—One of the veins at the bend of the elbow is the best site. The patient's arm is placed in a position of supination and extension, and the veins made prominent by a bandage or tourniquet above the elbow, and a movement of opening and closing the fist. The skin having been disinfected with Iodine, the index finger of the left hand steadies the vein which is very mobile.

Then the needle with the bevel upwards is held flat on the surface of the arm in the long axis of the vein, and by a gentle lifting motion is made to enter the vein from the side, care being taken that the opposite wall of the vein is not perforated. About a third of the needle is now passed along the vein, and gentle aspiration made to see that the needle is in the vein; this is confirmed by the appearance of blood in the syringe. The bandage round the arm is then slipped off, and the injection given slowly at a rate not exceeding 1 c.c. per minute.

As a rule not more than 10 c.c. should be given in this way. Larger quantities should be given from a Saline Infusion apparatus consisting of a glass barrel funnel, rubber tubing and clip and silver or glass cannula, the injection being warmed to about 105°F.

If during the injection a swelling appears around the vein, the injection should be immediately stopped, and if the injection is irritant as in the case of the Organic Arsonic compounds, an attempt should be made to draw as much as possible back into the syringe, and a cold pad applied to the arm. After withdrawal of the needle, pressure is made on the point of injection for a couple of minutes with a piece of sterile wool.

<i>Drug</i>	<i>Quantity</i>	<i>Use and Amount of Diluent</i>
Adrenalin ...	... 0.5 c.c. of 1 in 1,000 solution.	Usually added to 250 or 500 c.c. Normal Saline—to be given during period of 20 to 40 mins.
Antimon Pot. Tart. Antimon et Sod. Tart.	... Initial dose $\frac{1}{2}$ gr. in $1\frac{1}{2}$ c.c. of a 1% solution. Increased each week up to a maximum of 2 to 2.5 grains.	3-10 c.c.
Arsamin ...	... 0.01 to 0.05 gm.	1 c.c.
Arsenobenzol ...	... 0.3 or 0.6 gm.	300 c.c.
Caffein Sodium Benzoate ...	... 0.12 gm.	5 c.c.
Calcium Chloride ...	... 0.25 gm.	5 c.c.
Colloidal Copper ...	... 1 in 2,000	0.5-1 c.c.
Colloidal Gold ...	... 1 in 4,000	5 c.c.
Colloidal Mercury ...	... 1 in 2,000	5 c.c.
Colloidal Selenium ...	... 1 in 5,000	1 to 5 c.c.
Colloidal Silver ...	... 1 in 2,000	5 c.c.
Coramine ...	... 1 c.c.	Undiluted. In shock and cardiac failure.
Digitalinum Pulv. Pvr.	... 0.0006 gm. or 1/100 gr.	10 c.c.
Digitoxin ...	... 0.00015 gm. or 1/400 gr.	10 c.c.
Emetine Hydrochloride ...	... 0.03-0.04 gm.	5 c.c.
Euslavine ...	... 0.25 gm.	50 c.c. In lymphangitis and tuberculous glands.
Ephedrine Hydrochloride ...	... $\frac{1}{2}$ grain	5 c.c.
Ether ...	... 5% in N. Saline	For Anaesthesia.
Eusol ...	... 50 c.c.	Septicæmia, etc.
Ferri Cacodylas ...	... 0.06 gm.	5 c.c.
Gentian, Violet ...	... 0.2 gm.	80 c.c. in Septicæmia.
Glucose ...	... 5% solution	500 c.c. or more.
	... 50% 5 c.c.	Varicose Veins.
Glycerin ...	... 4 c.c.	4 c.c.
Hexamine ...	... $1\frac{1}{2}$ gm. increased.	10 c.c. Acidosis from Coli Infection. Chorea. Malarial Coma. Pyelitis of Pregnancy.
Hexamine with Sodium Iodide 1 gm.	... 1.5 gm.	20 c.c.
Hydrargyri Perchloridum ...	... 1 to 2% 1 to 3 c.c. 0.002 gm. 1/32 grain.	Varicose Veins. 5 c.c. Syphilis.
Indigo Carmine ...	... 0.02 to 0.04 gm.	10 c.c. Renal Efficiency Test.

<i>Drug</i>	<i>Quantity</i>	<i>Use and Amount of Diluent</i>
Magnesium Sulphate	... 10% solution 10 to 25 c.c.	Eclampsia.
Mercuriome ...	... 0.15 to 0.32 gm.	10 c.c. In desperate cases of Bacterial infection, stone.
Novarsenobenzol	... 0.15 to 0.9 gm.	10 c.c.
Paraldehyde ...	... 2½ to 14 gr.	
	... 5 to 15 c.c. with equal quantity of Ether.	150 c.c. Anæsthetic.
Phenolsulphonaphthalein ...	6 mgr.	2 c.c. Kidney Test.
Quinindine Hydrochloridum Acidum.	0.3 to 0.6 gm.	5 to 10 c.c.
Quinine Hydrochloridum Acidum.	0.5 gm.	10 c.c.
Quinine Hydrochloridum Acidum.	0.25 to 0.6 gm.	10 to 20 c.c.
Quinine-Urethane	... ½ c.c. later 3 c.c.	2 to Varicose Veins.
Sanocrysin ...	... 0.1, 0.25, 0.5, 0.75, Three doses of 1.0.	Brompton Hospital Course of six weeks total 4.6 gm. for Pulmonary Tuberculosis.
Silver Salvarsan	... 0.1 to 0.3 gm.	10 c.c.
Sodii Bicarbonas	... Coma has been treated with a litre of 3 to 5% solutions in portions. 1.95% is isotonic.	
Sodii Bromidum ..	... 1 gm.	10 c.c.
Sodii Cacodylas	... 0.05 gm.	1 c.c.
Sodii Chaulmoogras	... 0.03-0.06 gm.	1 to 2 c.c.
Sodii Chloridum	... 20% 3 to 10 c.c.	Varicose Veins.
Sodii Citras ...	... 0.4 gm.	10 c.c. added to blood in transfusion.
Sodii Morrhuas ...	... 5% 5 c.c.	Varicose Veins.
Sodii Salicylas ...	... 20 to 10% 1 to 3 c.c.	Varicose Veins
Strophanthin ...	... 1/240 to 1/60 gr.	10 c.c.

XI. LEECHING

Leeching is used for the abstraction of blood from congested parts inaccessible to wet cupping.

There are two varieties of natural leeches, their capacity varying from ʒj to ʒiv (4 to 16 c.c.). The artificial leech consists of a small cupping apparatus and a scarifier. With this about an ounce of blood can be withdrawn.

The number of leeches applied at one time should be from 1 to 6.

The site of the leeching should be shaved and well washed with soap and water. The leech is applied to the part in an

inverted test tube. If it refuses to take hold, the skin may be punctured or rubbed with a little sweetened milk. Once the leech has taken hold, it should not be disturbed until it is full, when it will drop off. sprinkling with salt will make it let go.

When the leech has dropped off, more blood may be removed by applying a hot fomentation. The bite is finally cleaned with sterile water and a gauze dressing applied; if the bleeding is still troublesome, a little alum or a compress of adrenalin chloride, with pressure, will stop it.

Leeches should not be applied to parts with much loose connective tissues, such as the scrotum, labia, penis and eyelids; otherwise, extensive ecchymosis may result. They should not be applied directly to an inflamed surface, as their bite is irritating.

XII. LUMBAR PUNCTURE

Lumbar puncture is used for both diagnosis and treatment. It is of importance diagnostically, as giving information as to the pressure of the cerebro-spinal fluid, and enabling its physical, microscopical, and bacteriological characters to be examined. Therapeutically, it is of value in relieving intracranial pressure; in cases of meningitis, cerebral tumour or abscess, hydrocephalus, uræmia, etc.; to allow the administration of sera in cases of tetanus and cerebro-spinal meningitis; and for the production of spinal anaesthesia.

ANATOMY.—In the lumbar portion of the vertebral column, the spinous processes do not project downward to such a degree as in other portions, and there is a definite space—about $\frac{3}{5}$ inch in the vertical, and $\frac{7}{8}$ inch in the transverse diameter—between the vertebral arches, through the ligaments of which a needle can be passed into the spinal canal. The cord ends at the second L.L.V., so that puncture may be made below that point, without fear of injury. The strictest asepsis must be observed.

NEEDLE.—Should be special stylet needle $3\frac{1}{2}$ to 4 inches long, of iridium platinum, the point being short and ground squarely across.

SYRINGE.—All glass and sterilized in plain water.

POSITION OF THE PATIENT.—Either sitting, with body bent well forward in the form of a curve, so as to widen the interspaces as much as possible, or lying on the left side, with the body bent forward in an arch.

SITE OF THE PUNCTURE.—A line drawn across the back, from the highest point of one iliac crest to the highest point

of the other, with the patient standing erect, passes through the tip of the fourth spinous process. The space between the 3rd and 4th, or the 4th and 5th vertebrae is usually chosen. The needle is inserted at a point just below the tip of the spinous process of the vertebra, forming the upper boundary of the interspace selected, and at a distance $\frac{1}{2}$ inch to either side of the median line, and directed slightly upwards and inwards. In children, the spinous processes being short, the needle may be inserted in the middle line.

The distance from the surface to the dura is usually $2\frac{1}{2}$ to 3 inches. The only proof of entering the subarachnoid space is the escape of cerebro-spinal fluid.

QUANTITY OF FLUID WITHDRAWN.—For diagnostic purposes, 5 c.c. ($1\frac{1}{2}$ dr.) in a child; 15 c.c. ($\frac{1}{2}$ oz.) in an adult. To relieve intra-cranial pressure, 1 to $1\frac{1}{2}$ oz., or even more, according to the tension, if no ill effects are produced, such as symptoms of shock, and embarrassed respiration. Following lumbar puncture, the patient should, if possible, remain absolutely recumbent, with the head of the bed raised, for 24 hours. This diminishes the severity of the subsequent headache.

XIII. OXYGEN

It is only recently that the value of oxygen in therapeutics has been fully appreciated, and in future it will probably prove of great value in the treatment of a number of diseases of the circulatory and respiratory systems.

In the past too little has been given, and considerable quantities must be used to be effective. A patient with fever breathes about 10 litres of air per minute and this contains two litres of oxygen; two extra litres per minute are required; oxygen bubbling through a Wolff's bottle only does so at the rate of about 0.2 litre per minute. It has been shown in cases of pneumonia that the arterial blood has at times only 80 per cent. saturation, which means that the oxygen tension is only 50 m.m. Hg. instead of the normal 100 m.m. Hg. If these two litres of oxygen per minute are given the degree of saturation can be increased to 91 per cent. or an oxygen tension of 70 m.m. Hg. and this is accompanied by marked improvement in the patient's condition.

The action however of oxygen in pneumonia is irregular as in some cases large patches of consolidation are cut off from all possibility of absorbing oxygen, and the blood leaving this part of the lung must be imperfectly oxygenated.

An important point in the treatment with oxygen is that it must be begun early before marked signs of cyanosis appear,

as once well-marked cyanosis is established it rapidly produces injury to the tissues and especially the heart muscle; it is therefore all-important to prevent cyanosis appearing. As regards administration the funnel is wasteful and inefficient; few patients can tolerate a mask; the best method is by a soft catheter passed in 2 to 3 inches into the post-nasal space; any irritation is allayed by smearing it with cocaine ointment, the catheter is fastened to the cheek by strapping. Oxygen as it issues from the cylinder is cold and dry, and it is therefore advisable to pass it through a warm coil of hot water.

XIV. SALINE

Physiological or normal saline solution is Sodium Chloride 9. Distilled Water to 1,000 or 0·9 per cent. Hypertonic solution is 1½–3 per cent., both must be made with doubly distilled water, as it has been shown that water first distilled, kept and then boiled, will give rise to fever if several ounces are injected into a vein, because it contains the dead bodies of bacteria. The ideal is water that has been doubly distilled within a few hours of use, the salt added after distillation, and the solution then boiled again; in practice however it is necessary to keep a quart flask ready made up hermetically sealed, to be warmed and used in case of emergency.

In cholera two solutions are used, the first being the hypertonic saline consisting of 120 gr. of Sodium Chloride, to which 4 gr. of Calcium Chloride are added on account of the tonic action which it exercises on the heart, these are dissolved in a pint of water. The second or alkaline saline solution consists of 90 gr. of Sodium Chloride and 160 gr. of Sodium Bicarbonate to the pint of water. The bicarbonate to avoid decomposition by boiling is sterilized in an autoclave and added to the already sterilized normal saline. Rogers advises that each time a patient requires a saline injection during the stage of copious evacuations while there is high specific gravity of the blood one pint of the alkaline solution is given, and the total quantity indicated is made up with the hypertonic solution, so that if the total is four pints, the first pint will be alkaline saline and the other three hypertonic saline. The following are the methods of administering saline:—

1. INTRAVENOUS.—In shock and hæmorrhage it is second best, and should not be given if blood or gum transfusion are available. The use of salines is a great advance in the treatment of head injuries; it combats the rise of intracranial pressure thus relieving the headache and irritability and lessening the stupor produced by cerebral oedema. In some

cases of puerperal sepsis, in eclampsia and after bleeding. In the stage of collapse and anuria in blackwater fever early alkaline salines will often save the patient's life.

2. SUBCUTANEOUS INJECTION.—One or two pints are run into the loose connective tissue under the breasts in women, into the thighs, axillæ or groins in men, or into the flank in children. If given continuously, about half a pint should be given per hour.

Saline must never be given subcutaneously in cholera, as in spite of all aseptic precautions, the area injected is very liable to slough on account of the patient's greatly lowered vitality.

3. PER RECTUM.—It may be given in one large amount, one or two pints after an operation, as it relieves thirst, promotes elimination and lessens shock, or it may be given continuously by the drip method at the rate of about one pint per hour. Saline is also used for irrigation of the colon in dysentery and the Plombieres' system of lavage of the colon in the treatment of rheumatoid arthritis.

XV. TRANSFUSION—BLOOD AND GUM

This method of treatment has the great advantage over saline infusion, which merely restores the volume of fluid, in that it replaces the red corpuscles in their capacity of oxygen carriers. The failures and disasters in the past history of transfusion were due to the absence of tests as to the compatibility of the donor's and the recipient's blood, a matter which is now easily ascertained. The whole point is whether the donor's red corpuscles will, or will not, be agglutinated by the plasma of the recipient; if they are agglutinated, the blood is not only useless but may cause multiple emboli or sudden death, and no transfusion should, under any circumstances, be performed without the tests.

There are four classes of blood known as Group Nos. 1, 2, 3, 4. The easiest method of finding the blood group of a donor is Vincent's. Sera of Groups 2 and 3 are purchased in capillary tubes and kept in stock.

To make the test a drop of Group 2 serum is put at one end, and a drop of Group 3 serum at the other end of a glass slide. The donor's ear is pricked and a small drop of his blood is mixed into each serum drop, by means of two match sticks. The agglutination is quite clear to the naked eye in about six minutes. The result will be as follows:—

Agglutination of the Donor's Red Corpuscles by Serum of	The Donor belongs to	Percentage of Frequency
Group 2 and Group 3 ...	Group 1	5
Group 3, but not Group 2 ...	Group 2	10
Group 2, but not Group 3 ...	Group 3	10
Neither Serum ...	Group 4	15

HOW TO CHOOSE A DONOR.—(1) Persons in Group 4 can give blood to any patient, and in this case it is not necessary to know to which group the patient belongs. (2) Otherwise the patient and donor must belong to the same Group.

HOW TO PROCEED IF SERA OF GROUPS 2 AND 3 ARE NOT AVAILABLE.—1. Draw about 5 c.c. of blood from the patient into a test tube and allow it to clot.

2. Take a large drop of this serum and add a trace of Citrate solution.

3. Mix a very small quantity of the donor's blood, if agglutination occurs in 5 minutes the donor's blood cannot be used. If there is no agglutination it can be used.

THE TECHNIQUE OF ADMINISTRATION.—A number of methods have been used:—

1. DIRECT TRANSFUSION.—A thin rubber tube about 8 inches in length with a silver cannula at each end sterilized and filmed by boiling in paraffin is connected with the radial artery of the donor and the basilic vein of the patient. One disadvantage among others is that it is impossible to gauge how much blood passes. The method should not be used.

2. INDIRECT TRANSFUSION—TRANSFUSION OF UNMODIFIED BLOOD.—There are two methods: (a) By the glass cylinder of Kimpton-Brown and a Higginson syringe the blood is sucked from the vein of the donor and driven into vein of the patient; (b) By Jube's method the same principle is carried out by means of a two-way syringe.

3. TRANSFUSION OF CITRATED BLOOD.—Into a glass jar of 20 to 30 oz. capacity which has been paraffin filmed, 4 oz. of a 4 per cent. Sodium Citrate solution (isotonic) are put. The donor's blood is drawn through a large bore needle by the suction of a Higginson's syringe into the jar, and mixed with the citrate solution by rotating. Then by another needle or cannula the citrated blood is blown by the pressure of the Higginson's syringe from the jar into the vein of the recipient. In the interval between the two operations the blood is kept warm by placing the jar in a bath of warm water. This method has two advantages—it can be performed single-handed, and the time available for the operation is considerably increased.

Success in blood transfusion depends on avoiding clotting in the apparatus, by careful handling of the blood, not allowing it to come in contact with tissue juices, or rough surfaces and operating quickly.

GUM TRANSFUSION.—In cases of hæmorrhage and shock hæmorrhage complex in which blood is not available at short notice, gum transfusion is a useful substitute. The solution is 6 per cent. Gum Arabic dissolved in 0.9 per cent. Sodium Chloride, warmed to about 110°F.; it is injected by a cannula attached by a rubber tubing to a funnel. Sterules are on the market which only require dilution with 250 c.c. of boiled tap water before transfusion.

XVI. VENESECTION

Formerly, all diseases, and even injuries, were treated by venesection, not for any good reason, but because bleeding was the fashion of the time. The practice is now limited to certain diseases, and is employed with definite objects, the principal being over-distension of the right heart.

CEREBRAL HÆMORRHAGE.—Although loss of consciousness is usually sudden, there is conclusive evidence that in most cases the hæmorrhage takes place as a gradual leaking. If, therefore, the blood pressure can be lowered, although only temporarily, the occurrence of clotting may save the situation.

HEART FAILURE.—In this condition, as in Cerebral Hæmorrhage, success depends upon the rapidity with which blood is withdrawn. Almost any form of cardiac disease may call for bleeding from engorgement of the right heart.

HIGH BLOOD PRESSURE.—Periodical venesection is of great value in the case of middle-aged obese patients of sedentary occupation and gluttonous habits, presenting the picture of arterio-sclerosis, high blood pressure and emphysema. It should not be practised, however, where the increased arterial tension is compensatory to a lesion, such as chronic nephritis.

BRONCHITIS, PNEUMONIA AND OEDEMA OF THE LUNGS.—Frequently causes engorgement of the right heart, and therefore cyanosis, especially in chronic bronchitis, complicated by an acute attack.

EPILEPSY.—Frequently does great good, when the patient is very livid, and the pulse small.

ANEURYSM.—Very often free bleeding immediately stops the fearful pain of this disease. Why this is so, is not clear but it is an undoubted fact.

BRIGHT'S DISEASE AND ECLAMPSIA.—Venesection may be required for some secondary condition of the heart or lung, or for uræmia.

POLYCYTHÆMIA VERA (ERYTHRÆMIA).—Venesection, repeated at intervals of three to four months, affords considerable relief.

THE OPERATION.—This is best carried out by Dr. French's apparatus which consists of a special conical needle to prevent clotting with a sharp triangular end, which transfixes the vein without pain, this is connected to an exhaust bottle. The needle having entered the vein the air in the bottle is exhausted by the hand pump and the blood flows in until the bottle is full.

The patient should be propped up in bed and one of the veins at the bend of the elbow selected, the vein being made prominent by a bandage tied round the arm, the patient opening and closing his fist.

ORGANOTHERAPY

Endocrinology has come in for a great deal of disrepute, and this for several reasons, namely, the articles in the lay press, the many widely advertised gland products which are worthless, the excessive dosage too often given, and failure to realize the all-important fact that it is not so much the hyper or hypo-functioning of a gland, but the interdependence of all the glands which constitute the system. Another point is that the technical details of successful extraction are imperfectly known, and consequently, the active principles may be destroyed in preparation.

As our knowledge of the internal secretions advances, the greater becomes the evidence of the close inter-relation of the endocrine glands, disease of one will cause considerable modifications in the secretion of others, with the result that the clinical picture depends on many factors. For example, because thyroid extract has been administered with success in any given case, it does not necessarily mean that the thyroid was at fault, but that the extract has stimulated an opponent gland, as the pancreas or suprarenal, to increased output, thus indirectly restoring the balance.

Taken as a whole the endocrine glands form a system which regulates the rate of metabolism, the growth and development of the body, and greatly influences the activity of the sympathetic and parasympathetic nervous system.

The study of the internal secretions or hormones presents many difficulties, as they are very complex organic compounds, easily destroyed by chemical treatment and of great physiological activity. As the total amount of any hormone gaining access to the blood daily in man is only a fraction of a milligram (0.015 of a grain). The difficulty of isolating such minute quantities is increased by the fact that no chemical tests are available and biological tests are often very difficult to devise or carry out.

The thyroid is the leader of the glandular system, exerting a far-reaching effect on metabolism, and when it fails in its true function, the whole endocrine system is thrown out of gear, but it is closely followed by the organs of generation in both sexes, which have a close relationship not only with the thyroid, but with the suprarenals, pituitary, pineal and thymus.

The annexed table showing the results of Hyper and Hypo-function of the ductless glands is copied from 'Organotherapy in General Practice' published by Messrs. G. W. Carrick & Co. Readers requiring further information are recommended to consult this work, which deals very fully with the whole subject.

RESULTS OF HYPERFUNCTION AND HYPOFUNCTION OF DUCTLESS GLANDS

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O'NEALA'S MEDICAL GUIDE

	THYROID		PITUITARY		ADRENALS	
	HYPERFUNCTION	HYPOFUNCTION	HYPERFUNCTION	HYPOFUNCTION	HYPERFUNCTION	HYPOFUNCTION
1	2	3	4	5	6	7
Hair	Luxuriant growth, fine texture and lustre.	Loss of hair or scanty growth. Brittle. Thinning of outer one-third of eyebrows.	Heavy growth of hair, particularly on extremities and chest. Heavy eyebrows.	Scanty hair growth. Hair distribution of opposite sex.	Early development of heavy, coarse hair. Heterosexual distribution. Eyebrows meeting in centre. Growth of beard in women.	Scanty growth.
Skin and Face	Soft, white velvet-like, moist skin. Increased perspiration.	Thick, infiltrated, rough dry-skin.	Thickened, dry, wrinkled. Large thickened nose. Thick lips. Enlarged tongue.	Soft, white, delicate skin or dryness of skin after puberty.	.....	Marked pigmentation and darkened color, particularly of genital organs. areola of nipple.

Stature and Skeletal System.	Small bones. Tapering fingers.	Dwarfism. Small, stunted deformed bones. Thick, club-like fingers.	Large skeleton. Distortion of bones of face, skull and epiphyses of long bones. Thick clubbed fingers.	Small stature. Small short bones. Tapering narrow fingers.	.....	.....
Mentality and Nervous System.	Anxious, restless, unstable and tendency to emotional upset. Nervous irritability. Tremor. Hot flashes. Insomnia.	Impairment of mentality. Dullness, imbecility, lack of initiative.	Slow mental processes. Stupor. Headache (in hypertrophy). Dull mentality.	Headache. Drowsiness. Apathetic. Sluggish and retarded mentality.	Alert, active mentality. Increased reactivity of the sympathetic nervous system.	Languid. Asthenic. Lack of interest.
Sexual Organs	Lowered sexual activity. Amenorrhoea.	Amenorrhoea. Lowered sexual activity.	Large sexual organs. Amenorrhoea. In late acromegaly, loss of sexual desire.	Sex characteristics of opposite sex. Polyuria. Very small sex organs. Amenorrhoea. Lack of sexual desire and power.	Male sex characteristics and enlarged clitoris in women. Precocious sex development. Large breasts. Early and irregular menstruation. Early potency.	Poorly developed sexual organs.
Gastro-Intestinal Tract and Teeth.	Diarrhoea, constipation, vomiting, indigestion, hyperacidity, white well-formed pearly teeth.	Constipation. Poorly formed irregular teeth. Delayed dentition.	Teeth widely spaced, particularly incisors.	.....	Digestive disturbances. Vomiting. Large canine teeth.	Pigmented teeth.

RESULTS OF HYPERFUNCTION AND HYPOFUNCTION OF DUCTLESS GLANDS—(Contd.)

	THYROID		PITUITARY		ADRENALS	
	HYPERFUNCTION	HYPOFUNCTION	HYPERFUNCTION	HYPOFUNCTION	HYPERFUNCTION	HYPOFUNCTION
1	2	3	4	5	6	7
Heart and Lungs.	Tachycardia. Irregular heart action and rapid breathing.	Low blood pressure. Slow heart action.	Voice changes to heavy tone.	Normal or low blood pressure. Slow pulse.	High blood pressure. Increased pulse rate.	Low blood pressure. Slow breathing.
Muscular System.	.....	.....	.....	Fatigability.	Increased strength (hyperfunction of cortex in women).	Asthenia. Fatigability.
Metabolism ...	Greatly increased metabolism. Lowered carbohydrate tolerance. Decreased body weight	Lowered metabolism. Obesity. Increased carbohydrate tolerance. Low body temperature.	Increased basal metabolism. Lowered carbohydrate tolerance. Glycosuria and hyperglycaemia.	Lowered metabolism. Obesity (girdle and mammary), (or thin delicate type). Increased carbohydrate tolerance.	Obesity. (Later loss of weight.) Increased metabolism.	Disturbed carbohydrate metabolism. (Usually increased.) Loss of weight.

Diagnosis of Diseases or Prominent Signs and Symptoms Requiring Treatment.	Exophthalmic goitre. Goitre. Gastro-intestinal disorders.	Constipation. Cretinism. General debility. Backward children (mental and physical). Asthenia. Physical and mental inertia. Amenorrhoea.	Acromegaly. Amenorrhoea. Impotence to Tendancy to gigantism.	Low temperature. Dystrophia Adiposogenitalis. Assumption of characteristics of opposite sex. Immature sexual development. Impotence. Asthenia. Lack of physical and mental force and initiative.	Assumption of characteristics of opposite sex. High blood pressure. Obesity. Sexual precocity. ('Infant Hercules.') Early menstruation.	Asthenia Lack of physical and mental force. Low blood pressure. Neurasthenia. Addison's disease.
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RESULTS OF HYPERFUNCTION AND HYPOFUNCTION OF DUCTLESS GLANDS—(Contd.)

OVARIES		TESTES		THYMUS	PINEAL	PARATHYROID	
HYPER-FUNCTION	HYPO-FUNCTION	HYPER-FUNCTION	HYPO-FUNCTION	HYPER-FUNCTION	HYPER-FUNCTION	HYPER-FUNCTION	HYPO-FUNCTION
8	9	10	11	12	13	14	15
Early development of axillary and pubic hair.	Lack of development of axillary and pubic hair.	Early development of axillary and pubic hair.	Scanty hair with distribution of feminine type.	Hair distribution of opposite sex.	Tendency to extensive development of hair.	.....	...
.....	.....	...	Thin, white skin.	White skin.	.. ...	.....	.....
Rapidly developing large skeleton. Osteomalacia.	Tall slender skeleton.	Rapidly developing tall skeleton.	Tall, thin type with delicate arms and legs, or fat sluggish type.	Either tall or short. Physical contour of opposite sex.	Increased height.	Tendency to deposits of calcium salts.	..

Tendency to mental precocity.	.....	Tendency to mental precocity.	Slow mentality. Dullness. Lack of 'drive' and initiative.	...	.....	....	Tendency to mental precocity.
Precocious sexual development and desire. Early menstruation. Menorrhagia.	Undeveloped sex organs. Amenorrhoea or irregular menstruation.	Large sex organs. Precocious sexual activity.	Small, undeveloped sex organs.	Undeveloped sex organs	Enlarged sexual organs. Sexual precocity. Early puberty.	....	Spasms of muscles of face, hands and feet. Excitability of peripheral nerves.
Early dentition.	.....	Early dentition.	.....	Large, middle incisors (lateral incisors normal).	Gastro-intestinal symptoms.	.....	Defective teeth. Gastro-intestinal symptoms.

RESULTS OF HYPERFUNCTION AND HYPOFUNCTION OF DUCTLESS GLANDS—(Contd.)

OVARIES		TESTES		THYMUS	PINEAL	PARATHYROID	
HYPER-FUNCTION	HYPO-FUNCTION	HYPER-FUNCTION	HYPO-FUNCTION	HYPER-FUNCTION	HYPER-FUNCTION	HYPER-FUNCTION	HYPO-FUNCTION
8	9	10	11	12	13	14	15
Low blood pressure.	High blood pressure.	.....	.....	Thymic asthma. Difficult respiration due to pressure symptoms. Atrophic cardio-vascular system. Irregular heart.	.....	Arteriosclerosis. High blood pressure.	.....
.....	.....	.....	.....	Asthenia, Muscular weakness.	.....	.....	.....

Osteomalacia, menorrhagia, dysmenorr- hoea. Sexual precocity.	O b e s i t y, L o w e r e d metabolism.	Sexual immu- nity. In- fantilism.	Infantilism. Sexual im- maturity.	Sexual pre- cocity.	O b e s i t y, I n c r e a s e d carbohydrate tolerance.	Def e c t i v e c a l c i u m metabolism.	Ulcers, vari- cose, gastric and duodenal. Defective cal- cium metabol- ism.
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ADRENAL

Suprarenal Extract. Synonyms: Hemisine, Epinephrine and Adrenine.

PREPARATION.—Liquor Adrenalini Hydrochloricus—Adrenalin 1, Chloroform 5, Sodium Chloride 9, Acid Hydrochloric Dil. 3, Distilled Water 1,000. Preserved in amber glass bottles.

Adrenal preparations stimulate the nerve endings of the sympathetic system and produce a contraction of capillaries and arterioles, with consequent rise in blood pressure. Dose: 10 to 30 m.

MEDICAL INDICATIONS FOR THE USE OF ADRENALIN.—

1. IN ANAPHYLAXIS.—For the dyspnoea and collapse of this condition the best form of treatment is to give Adrenalin (1 in 1,000) 0.5 c.c. into muscle or a vein.

2. AS A RESTORATIVE.—If the heart has ceased to beat as the result of respiratory failure, or from a great fall in blood pressure, the only means of reviving the patient is by the direct injection of Adrenalin into the heart and massage of the heart to restart the beat.

3. ASTHMA.—5 to 10 m of the Liquor, hypodermically. The effect is supposed to be due to sympathetic stimulation, with consequent relaxation of the bronchial musculature.

4. IN TOXAEMIAS—such as in broncho-pneumonia, adrenalin should be given in order to sustain the blood pressure and provide the heart muscle with more blood. The latter result depends on the fact that the coronary arteries are not constricted by adrenalin. The dose should be 1 m hypodermically for each year of age, with a maximum of 10 m, two-hourly. On no account may the drug be given in such doses for longer than 24 hours lest necrosis of the liver result.

5. HICCOUGH.—Adrenalin may be given in doses of 3 to 5 m. It is particularly valuable in the epidemic hiccough, such as is associated with influenza.

6. IN ADDISON'S DISEASE, which is tuberculosis of the suprarenals, it is useless.

7. Animals, apparently dead from ASPHYXIA, and animals electrocuted, have been brought round by the injection of adrenalin and salt solution into the jugular vein, together with artificial respiration. In man, it may be injected direct into the heart in cases of syncope.

8. SNAKE-BITES.—It has been suggested to inject adrenalin into the tissues near the site of the bite, the resulting vaso-constriction retaining the poison, until it is oxidized or destroyed.

9. ENLARGED SPLEEN.—Tremendous enlargements have yielded to 5-drop doses t.i.d.s., continued for a period of several weeks.

10. Hay Fever, Laryngitis and Vomiting of Pregnancy.

SURGICAL INDICATIONS FOR THE USE OF ADRENAL PREPARATIONS.—1. With Eucaine or Cocaine it is used for minor operations, which are thereby rendered bloodless. Locally, it is used as a hæmostatic before operations on the nose, adenoids and piles.

2. Collapse from hæmorrhage, shock, surgical heart failure, asphyxia and drowning. Dose: 5 m of the liquor to one pint saline at 105°F. (40.5°C.), given very slowly intravenously; too rapid injection causes cramp of the cardiac muscle and holds it in systole. In urgent cases, 10 m in 3j saline should be given into a vein, with a hypodermic syringe. In cases of collapse, due to chloroform, artificial respiration and the hypodermic use of 1/100 gr. Atropine help considerably.

3. Injection into liver has enabled large areas to be removed.

4. CÆSARTIAN SECTION.—Uterus can be made to contract firmly by injecting 1 c.c. of a 1 in 1,000 solution, at four different points. It has a powerful effect in both the pregnant and non-pregnant uterus.

5. URETITRAL STRICTURE.—Five to ten drops of a 1 in 5,000 solution, deposited with a urethral instillator, just in front of a deep stricture, will often so relieve the congestion as to allow a moderate-sized instrument to pass. It has also been injected into the bladder before operations to diminish the hæmorrhage.

6. HÆMORRHOIDS.—Either alone or combined in an ointment.

CONTRA-INDICATIONS TO THE USE OF ADRENALIN.—(1) Aneurysm, (2) Arterio-sclerosis, (3) High Blood Pressure, (4) Myocardial Disease or Dilatation.

STABILITY OF ADRENALIN.—The hydrochloride the commonly used salt is stable provided that the reaction of the solution is acid, if neutral or alkaline it quickly oxidises and turns pink. It must contain a preservative, this is usually Chlorbutol.

A hormone has recently been extracted from the supra-renal cortex which is almost free of Adrenalin, and if injected into cats from which the supra-renal glands have been removed will indefinitely prolong their lives, without this injection the maximum period of life is 15 days.

INSULIN

Insulin is a hormone the 'internal secretion' of the pancreas and its main function in the body, is to preside over the economy of dextrose.

In health sugar is never found in the urine, except after an excessive meal of carbohydrates, or under the influence of nervous excitement. Although much more carbohydrate may be eaten than is required immediately, the sugar formed from it, and which circulates in the blood is not excreted in the urine, but stored in the form of animal starch or glycogen, and none of this valuable food is wasted, as muscle in performing work by contracting, derives its energy directly from the breaking down of dextrose.

Sugar is normally present in the blood to the extent of about 0.1 per cent., and at this amount is not excreted by the kidneys, should however the percentage rise to 0.17 or 0.2 then sugar would appear in the urine, but to avoid this loss the conserving mechanism stimulates the pancreas to discharge Insulin into the blood, and the excess of sugar above 0.1 per cent. is then stored in the body as glycogen by the aid of the Insulin.

The efficiency of this mechanism can be judged by the fact that if a large dose of Dextrose 0.5 gm. be injected into the blood of a rabbit, the blood sugar returns to the normal within half an hour. We do not as yet however understand the whole of its effect. The diabetic patient not only fails to store his excess of sugar, but he continually forms Dextrose even when fasting, a formation which is immediately stopped if Insulin is injected.

Further the diabetic urine may in addition to sugar contain Acetone bodies which produce coma, but the injection of Insulin almost always causes a rapid disappearance of these bodies from both the blood and the urine, but at present we are unaware as to how this effect is brought about.

THE PREPARATION OF INSULIN.—Many methods are now available, but the pancreas when removed from the animal must be frozen at once or the activity will be greatly reduced, the extraction is then made with alcohol, which may be acid or alkaline according to the method used. For details see Dodds

and Dickens, 1925. The Chemical and Physiological Properties of the Internal Secretions.

ESTIMATION OF THE POTENCY OF INSULIN.—When Insulin is injected into the normal animal it produces two effects:—

- 1 A fall in the per cent. of blood sugar which is called hypoglycæmia, should the dose of Insulin be large enough to cause a fall of blood sugar below 0.04 per cent. the rabbit usually suffers from
2. Convulsions—and these convulsions cause a rise in the blood sugar.

These two effects—the fall in the percentage of blood sugar and the convulsions—can both be used in order to measure the strength of the Insulin. There is an International standard of Insulin, *i.e.* a quantity of dried Insulin Hydrochloride, and the unit is defined as the amount of activity contained in 0.125 mgm. of this standard.

INSULIN DOSAGE.—How to assess in a case of Diabetes.

The essential condition of treatment is to secure a condition of pancreatic rest. For this two factors are necessary:—

- (1) A stable and constant diet quite sufficient for the patient.
- (2) A dose of Insulin as large as possible short of producing Hypoglycæmia.

To do this—

- (a) Calculate the calory value required upon the weight which a patient of his or her age, height and occupation should be. For this see table of Weights at varying ages page.
- (b) 25 to 30 Calories are required per kilogram of patient's weight.

Note.—A kilogram=2.2 lbs.

- (c) This is obtained from Proteins, Carbohydrates and Fats. 1 gram of either of the two former yields 4 Calories, and 1 gram of Fat, 9 Calories.

Therefore a man of 40, 6 feet in height, weighing 180 lbs., in active work would require 2,400 Calories, *i.e.* 80 kilograms \times 30.

- (d) As far as possible it is advisable to adhere to the proportion of a normal diet, *i.e.* a ratio of Protein 100, Fats 100 and Carbohydrates 400.
- (e) This value of 2,400 Calories being decided on, the amounts of Protein, Fats and Carbohydrates are proportionally worked out among the various food stuffs, in the following food table, from whatever the patient prefers and can afford to purchase.
- (f) A number of diets are prepared of the same Calory value, so as to give variety each day.
- (g) Then the full amount of diet is given whether the blood-sugar rises or not, and the dose of Insulin is increased each day or alternate days until the blood-sugar comes within normal limits, *i.e.* between 0.075 and 0.125 per cent.
- (h) When a standard diet has been commenced blood-sugar tests should be taken daily 4 hours after the Insulin dose, if only one is given, or if two are given 4 hours after the maximum dose.
- (i) The blood Cholesterol figures should, it is said, not be above 180 mg. per 100 c.cm. of blood, otherwise arterio-sclerosis may develop.
- (j) It is advisable to produce a Hypoglycæmia before the patient commences his own treatment, in order that he may realize what the symptoms are, and know how to treat them by taking sugar.
- (k) The patient must be taught how to give himself the injections, how to look after his syringe, and how to test his urine for sugar.
- (l) Blood-sugar examinations should be made every 8 or 4 weeks as with pancreatic rest, reduction of Insulin dosage is frequently possible, and in some cases suspension of Insulin dosage may be possible for some months. But in severe cases the injections will have to be continued permanently if the patient's improved condition is to be maintained.

LIVER EXTRACT

The object of giving Iron to anæmic patient is that their shortage of red corpuscles may be due to lack of Hæmoglobin, which in turn may be due to an absence of the essential Iron.

Minot and Murphy in 1926, found that the daily administration of half a pound of fresh liver cured Pernicious Anæmia,

a disease which had previously been intractable and fatal. The effect of the liver is to cause a more or less steady rise in the percentage of Hæmoglobin, and in the number of the red and white corpuscles. The improvement is first noted in 14 to 21 days by the appearance of reticulocytes, *i.e.* newly formed red cells having a network of reticulum which can be stained, these subsequently diminish, while the normal red cells and hæmoglobin increase greatly.

The nervous symptoms of subacute combined degeneration, will probably remain stationary or progress, but stomach powder is more effective in benefiting this aspect of the disease.

OVARIAN HORMONES

Two hormones are produced by the ovary—Oestrin and one from the corpus luteum, the former promotes those changes which facilitate the fertilization of the ovum, while the other acts in the interest of the ovum already fertilized. The relation between the action of the two hormones has not yet been fully worked out, but the growth and distension of the uterus with fluid, which is caused by Oestrin, is apparently to facilitate the fertilization of the ova by spermatozoa. While the much greater growth of the uterus caused by the corpus luteum is to help the embedding of the fertilized ovum in the wall of the uterus, and an increased vascular supply to nourish it.

From the point of view of practical therapeutics there are two directions in which Oestrin might be of value: (1) To cure sterility and amenorrhœa; (2) As an agent to induce labour, at some point before the natural termination of pregnancy, and this would of course be a great advance in midwifery. The extract of corpus luteum might be of value in curing sterility due to a uterus not having undergone development sufficient for a fertilized ovum to be implanted, or as a cure for dysmenorrhœa.

PARATHYROID GLANDS

If the Parathyroids are removed from an animal within 24 to 48 hours it develops tetany, *i.e.* it begins to pant with tremors of the limbs, followed by convulsions, and if untreated, death. These symptoms coincide with a fall in the amount of calcium circulating in the blood, and are relieved by the injection of a soluble calcium salt. Apparently the fall in the amount of circulating calcium causes an increased excitability of the nerves.

It has recently been discovered that Von Recklinghausen's disease or osteitis fibrosa is due to a tumour of the parathyroid. This condition is due to withdrawal of calcium from the bones and is excreted in the urine, under stimulation secretion of

the parathyroid hormone. The removal of these tumours has caused the withdrawal of calcium to be stopped, and the blood calcium to return to the normal.

Parathyroid extract has been given in a great variety of other disease with negative results.

PITUITARY

Properties of the Posterior Lobe Extract:—

1. It is an excellent circulatory stimulant acting rapidly within one or two minutes.
2. It produces strong uterine contraction by acting directly on the muscle cell.
3. Has antidiuretic action and is given for this reason in diabetes insipidus.
4. Increases intestinal peristalsis, this action is often very valuable to open the bowels after abdominal operations.
5. It has been given to promote the secretion of milk.

Properties of the Anterior Lobe Extract:—

1. Has a most striking effect on growth.
2. It would appear that the anterior lobe controls the alternate production in the ovary of the hormone oestrin, which prepares the way for the fertilization of an ovum and the hormone of the Corpus Luteum which acts so as to protect an already fertilized ovum.
3. A substance acting on the thyroid gland.
4. A substance producing ovulation in pregnant mice.
5. A substance which in monkeys initiates the bleeding of menstruation.

TESTICULAR HORMONE

A preparation has been made from the testis by McGee which has Physiological properties. This hormone is produced by the interstitial tissue of the testis, and has the property of producing growth of the comb in capons (young cockerels from which the testes have been removed). Further that an extract of the testes of the bull was able to counteract all the effects of castration in animals, even those of long standing.

If the vasa deferentia are tied, the subject is said to be rejuvenated, this change is explained as being due to the degeneration of the cells responsible for Spermatogenesis and increased growth of the interstitial tissue, thus producing more testicular hormone. Clinical reports have not as yet been published, but it is likely that this hormone will come into extensive use.

THYROID

The effect of therapeutic doses of thyroid is to increase the metabolism, with the result that energy is more quickly liberated, and this is easily shown by the increased intake of oxygen.

It has long been known that the thyroid contains Iodine in organic combination and attempts to standardize preparations are based on this. Now the whole of the Iodine occurs in two substances, Thyroxine and Di-iodotyrosine, the former has all the effects of thyroid extract itself, while the latter is physiologically inactive, hence the best standardization of thyroid is in terms of Thyroxine Iodine. There is great variation in the activity of different samples of thyroid.

There are a vast number of conditions, in which good may rationally be expected, from judicious thyroid therapy. Perhaps the most satisfactory cases will be those of minor thyroid inadequacy, especially in children. These cases are very common, often there is no tangible symptom to which a name can be given, and other lines of treatment have failed. In older people, especially women, thyroid inadequacy is just as common as anæmia, and equally important in its results.

Thyroid Treatment has been given with benefit in the following conditions:—

1. IN CHILDREN.—

Adenoids.	Enlarged Tonsils.
Backwardness.	Night Terrors.
Enlarged Lymphatic Glands.	Nocturnal Enuresis.
	Rickets.

2. IN BOYS.—

Albuminuria.
Exhaustion of the Thyroid from the Infantile Infectious Diseases and Influenza.

3. IN GIRLS AND WOMEN.—

Abortion.	Lactation.
Dysmenorrhœa.	Menopausa.
Establishment of the Menses.	Menorrhagia.
	Sterility.

4. SKIN LESIONS.—

Alopecia.	Lupus.
Cheloid.	Psoriasis.
Eczema.	Urticaria.
Leucodermia.	

5. GENERAL CONDITIONS.—

Beri-beri.	Myxœdema.
Chorea.	Obesity in some cases.
Cretinism.	Premature Greyness.
Hæmophilia.	Rheumatoid Arthritis.
Hypersensitiveness to cold.	Subnormal Temperature.
Loss and Scantiness of Hair.	Tetany.
	Undue Dental Caries.
	Ununited Fracture.

DOSE.—The dose should be from 1/10 to 1 gr. t.d.s. The dose given in most books, 3 to 10 gr., is far too large. It may be given in the form of tabloids or the Elixir Colloid of Messrs. Squire & Son, or ground in a mortar with water and incorporated in a mixture which may contain any other drug except pepsin. The addition of Arsenic Iodides and Calcium tends to prevent inhibition of the gland's own activity.

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REJUVENATION BY GRAFTING

Dr. Voronoff contends that the internal secretion of the testicle is more vital to the preservation of the physical energy of the body and lucidity of the mind than to the maintenance of the vigour of the sexual organs: the testicular graft is not an aphrodisiac.

The grafts, usually from the testicle of an ape, are introduced in the form of thin slices, into both tunica vaginales at appreciable distances apart; the host nourishes the graft, and the graft bestows upon its host qualities and characteristics determined by the nature of the secretion which its cells continue to elaborate. It is not opotherapy: the true graft is a method far superior to the opotherapeutic embedding of a gland; in the latter case the duration of the result is necessarily limited to the length of time required for the absorption of the gland—a matter of weeks; on the other hand, the result from the graft is not only far more permanent, but infinitely more satisfactory.

THE RESULTS IN ANIMALS, RAMS AND GOATS.—Old rams become young in their gait, full of vitality and energy, the coat improves, the body remains slender with loss of fat, and the sexual appetite is retained.

THE RESULTS IN MAN, which are in no way referable to auto-suggestion, are:—

- (1) Constant reduction of blood pressure which fell from 23/21 to 16/14 by Pachon's instrument.
- (2) Diminution of adiposity due to improved metabolism, amounting to 10 to 15 pounds within 2 or 3 months.
- (3) The improvement of vision in the presbyopic, due to increased tonicity of the muscles of accommodation.
- (4) Improvement in general health, noticeable in gestures, look, expression and attitude, the patients clearly becoming more virile.
- (5) The improvement in the mental condition is very marked, memory returns, and the capacity for work is increased, but the increased physical and

mental energy is not invariably accompanied by renewed sexual activity.

- (6) As regards prolongation of life, the evidence strongly points to these, if the patient does not give way to excesses.

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THE ARSENOBENZENE COMPOUNDS

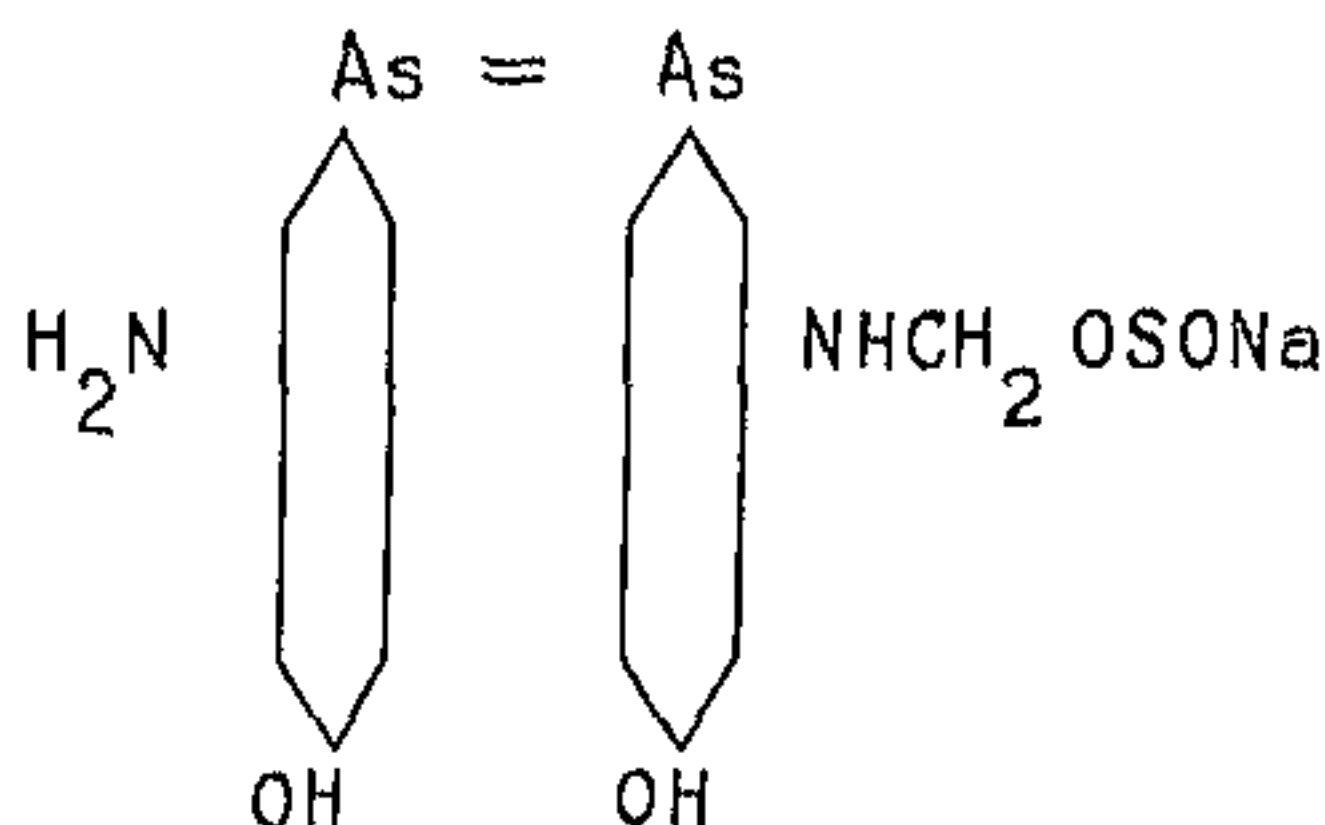
The organic arsenic compounds used to-day are the result of prolonged research by Ehrlich to discover compounds which would destroy protozoal organisms infecting the body, *i.e.* spirochætes causing syphilis and trypanosomes causing sleeping sickness. Not only are these researches important from the practical results achieved, but it commenced a new era in pharmacology, *i.e.* a systematic search for new synthetic drugs.

Ehrlich for each substance prepared, estimated by the tolerated dose, *i.e.* the largest dose which could be given to an uninfected animal without causing serious symptoms or death, and also the curative dose that is the smallest dose which would cure the infected animal. The higher the ratio $\frac{\text{Dosis Tolerata}}{\text{Dosis Curativa}}$ then the more useful was the drug in treatment.

Ehrlich considered that no substance could be safely used unless the ratio was at least three, and he endeavoured to find a drug with as high a ratio as possible. In the series of substances examined Salvarsan was 606. It was found that different species of protozoa possessed different powers of resistance to different compounds, and that the parasites rapidly acquired a *tolerance to drugs.

Ehrlich found that the most efficient substances were compounds of trivalent Arsenic united to a benzene ring with an amino group in the para-position. Dihydroxy Diaminoarsenobenzene was found to have the most favourable ratio between the sterilizing and tolerated dose of all substances examined. It is amphoteric as its amino groups can unite with acids to form salts, and the hydroxyl groups can unite with alkalies to form salts. As the acid salts are stable, Dihydrochloride acid salt was chosen as the most suitable form for therapeutic use and was named Salvarsan.

The following shows the reactions and method of preparation of Salvarsan for intravenous injection:—

*Salvarsan*

Soluble in water, but forms an acid solution which is very toxic and irritant, and therefore cannot be given intravenously.

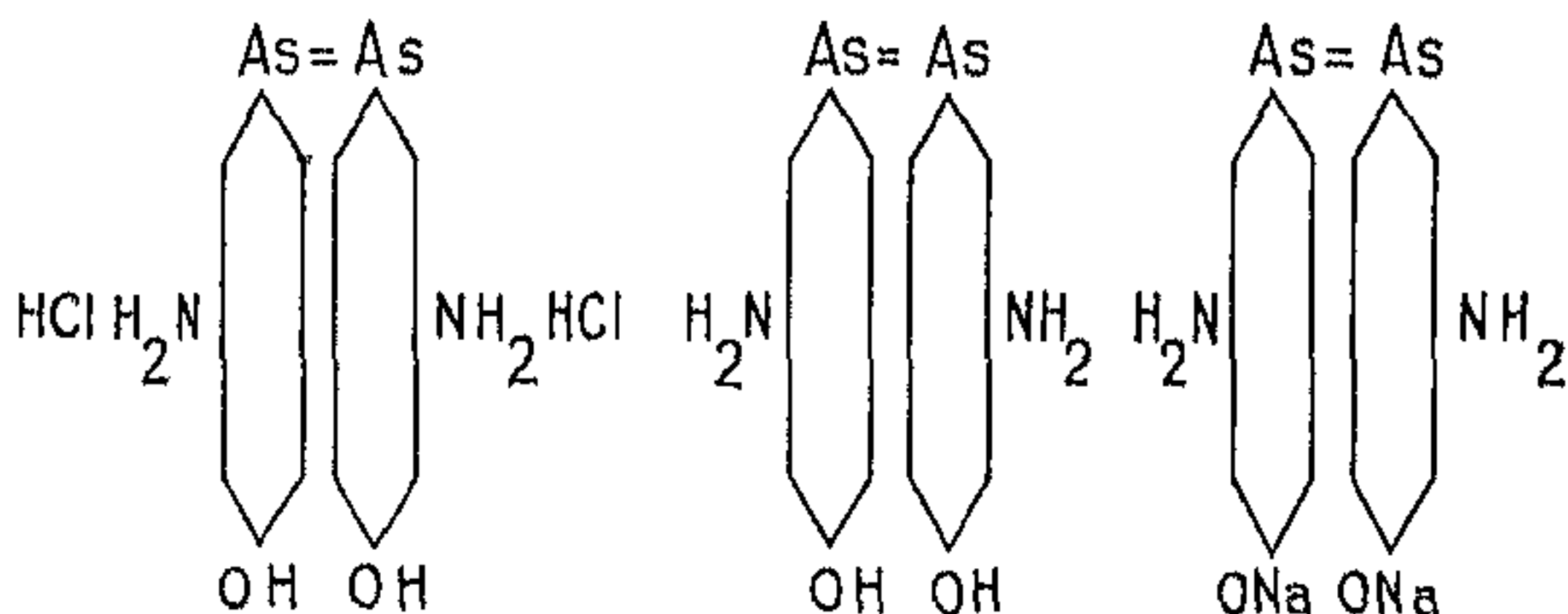
Neutral Base

The addition of 2 gram molecules of Sodium Hydrate to one gram molecule of Salvarsan sets free the neutral base, a turbid suspension insoluble in water. It cannot be given intravenously but can be used intramuscularly.

Alkaline Salt

The addition of a further two gram molecules of Sodium Hydrate produces the Alkaline Salt of Salvarsan. This is freely soluble and is the form in which Salvarsan is given intravenously diluted to the extent of 200 c.c. of water to 0.1 gram of Salvarsan. This solution cannot be given intramuscularly.

It was found in practice that the preparation of Salvarsan was too difficult to be satisfactory for general use; to obviate this difficulty Ehrlich prepared Neosalvarsan, a product of Salvarsan and Sodium formaldehyde sulfoxylate which has the formula



Neosalvarsan is a stable preparation dissolving in water in neutral solution and can therefore be injected intravenously in a concentrated solution, *i.e.* a dose of 0.6 gram dissolved in 10 to 20 c.c. of water. Being safer and much easier to administer it has become the standard organic arsenic compound for clinical use. The percentage of Arsenic, however, may vary from 18 to 21 per cent. It is sold in amber coloured glass tubes, with

the air displaced by Nitrogen and each tube contains either 0.3, 0.45 or 0.9 of a gram.

The distinctive feature of the Organic Arsenic Compounds as compared with the Inorganic, is that the Arsenic is in chemical combination with a Carbon atom. The classes of Organic Arsenic Compounds are:—

I. Pentavalent Arsenic Compounds:—

1. SODIUM AMINARSONAS.—Synonyms—Atoxyl or Soamin. It is little used now as in the past it has produced many cases of permanent blindness from optic nerve atrophy.
2. TRYPARSAMIDE.—Used in the treatment of African trypanosomiasis and cerebral syphilis having little effect on spirochaetes, but with a high degree of penetration.
3. STOVARSOL.—Weaker than Neosalvarsan, but has been much used in France as a prophylactic in cases of suspected syphilitic infection.
4. ACETYLARSAN.—A simple derivative of Stovarsol used intramuscularly or subcutaneously for infantile syphilis.

II. Trivalent Arsenic Compounds:—

1. SALVARSAN.—Synonyms—Arsenobenzol, Kharsivan, Arsphenamine.
2. STABILARSAN.—Is a compound of one molecule of Salvarsan and two molecules of Glucose. It is supplied in ampoules containing 10 per cent. solution of the Stabilarsan and 50 per cent. Glucose, which can be injected intravenously without dilution.
3. NEOSALVARSAN.—Synonyms — Novarsenobenzol, Nevarphenamine, Neokharsivan.
4. SULPHARSENOL (SULPIARSPIENAMINE).—Is a substance formed by treating Arsenobenzene with Sodium Formaldehyde bisulphite; it is given intramuscularly, but is not so effective as Neosalvarsan.
5. SILVER SALVARSAN.—Is a compound of Silver and Arsenobenzol containing 20 per cent. Arsenic and 15 per cent. Silver. It has twice the therapeutic and toxic action of Arsenobenzol and is given in advanced cases.

MODE OF ACTION.—Ehrlich originally considered that the drug had a simple parasitocidal action, certain side-chains in the drug having a selective chemical affinity for certain side-chains in the protoplasm of the spirochaetes. And that therefore the drug killed spirochaetes at a concentration, which did not injure the patient's tissues. But the mode of action is more complicated, there is little or no action *in vitro*, but a powerful action *in vivo*, and this would appear to be due to oxidation in the body.

Whereas it was at first thought that a single massive dose would at once cause an immediate sterilization from spirochaetes, it is now known that these drugs form storage depôts of relatively non-toxic substance in organs, such as the liver, and that their therapeutic action is brought about by a continual liberation of more active substances into the blood stream, hence the replacement of a single injection by a series of injections.

STANDARDIZATION.—While organic arsenic compounds are synthetic preparations of known composition, it has not been found possible to standardize their potency by chemical and physical tests only; this must be controlled by biological standardization.

TOXIC EFFECTS FOLLOWING THE EMPLOYMENT OF ARSENOBENZOL PREPARATIONS

The following is the report of the Salvarsan Committee of the Medical Research Council:—

1. No special arsenobenzol preparation can be regarded as more likely than others to produce ill effects.
2. Large series of cases of syphilis have been treated without the occurrence of any serious ill effect, although a small percentage of slighter reactions, chiefly vasomotor and mild skin reactions, is to be expected in every large collection of patients treated with arsenobenzol compounds.
3. Errors in technique cannot account for more than a few serious accidents; fatalities have occurred even under the most careful control in large and completely equipped hospitals.
4. The most important ill effects which may end fatally are:—
 - (a) Encephalitis hæmorrhagica.
 - (b) Acute yellow atrophy of the liver.
 - (c) Exfoliative dermatitis and its complications.

5. In European literature, and especially in the very large German literature, encephalitis hæmorrhagica is most frequently described. In Great Britain and America, however, exfoliative dermatitis and its septic complications have accounted for most fatal accidents. Acute yellow atrophy of the liver is difficult to place in order of frequency, being distinguished from the other serious ill effects by its peculiar liability to occur in localized outbreaks. Single cases, however, are by no means unknown.
6. Encephalitis hæmorrhagica occurs within two to five days after an injection, and presents a very characteristic clinical picture. Its incidence is most frequent after the second injection, but it may ensue after any one of a series of injections. It must be considered as due to the arsenobenzol treatment.
7. Disorders of the liver following treatment by arsenobenzol compounds may for convenience be grouped into—
 - (a) Early (benign) jaundice.
 - (b) Late (severe) jaundice.
 - (c) Acute yellow atrophy of the liver, commonly the sequel of late jaundice, and clinically and pathologically indistinguishable from the same condition occurring in the known absence of syphilis.
8. Skin reactions following arsenobenzol are fairly common, and usually slight and transient. The one reaction of serious significance is exfoliative dermatitis.
9. Vasomotor phenomena occur in a small proportion of cases, even under the best conditions. Although alarming at the time, they are rarely, if ever, fatal. They appear to bear no relation to anaphylaxis, and the use of this word in describing them is to be deprecated. Febrile disturbances, headache, diarrhoea and vomiting also occur, but are usually of slight moment.
10. Certain other ill effects of arsenobenzol treatment, which may even end fatally, are met with only very rarely. These include acute renal damage, ulcerative enteritis, polyneuritis, and aplastic anæmia.

11. Certain lessons, as regards dosage and frequency of administration, have been learned from the experience of the late War. During the War period following a definite military policy, the dosage and frequency were, in some places, increased over what would nowadays be recommended. The Committee believe that both dermatitis and hepatic disorders may, in part at least, be due to excessive frequency and size of the dose.

PHOTOTHERAPY

Phototherapy is a term derived from two Greek words meaning light and heat and is the therapy of radiant energy.

The therapeutic value of artificial light apparently depends chiefly on the wavelength of the rays.

Artificial light used for treatment may be grouped under two heads: (1) Rays that emit heat and visible rays only, (2) Ultra-violet rays.

I. HEAT AND VISIBLE RAYS.—The sources of these rays are the Leucodescent lamp and the Dowsing incandescent lamp; the former is a high power incandescent electrical light of 300 to 500 candle power; the effects are those of heat alone. The lamp is mounted on a bracket and moved up and down, after being focused on the skin at a distance of about two feet, for a period of about ten to fifteen minutes, the treatment can be repeated daily. The Dowsing incandescent lamp is less powerful than the above, but small, portable and easily manipulated and is therefore useful in treating small areas, such as individual joints. The following affections can be treated by these rays: Neuralgia, the pain of this condition may be greatly alleviated, it is also useful in fibrositis, arthritis, muscular rheumatism, and local inflammatory conditions due to pyogenic organisms, such as furunculosis and abscesses. The rays relieve the pain and bring them to a rapid head for opening.

II. ULTRA-VIOLET RAYS.—Ultra-violet rays have a potent action killing micro-organisms, but have little power of penetration; they produce pigmentation and erythema of the skin; but apart from this bactericidal power they have a general effect on metabolism and raise the bactericidal power of the blood, and lymphocytosis. Ergosterol, normally present in the skin, under the influence of ultra-violet rays produces Vitamin D which is specific for the growth of bone and healing of wounds. The following sources of artificial light are used in ultra-violet treatment: (1) The Mercury Vapour Lamp, (2) The Kromayer Lamp, (3) The Carbon Arc, (4) The Tungsten Arc. The Mercury Vapour Lamp is relatively poor in heat waves but is rich in ultra-violet rays. In treatment the coldness of the light is compensated for by a circle of incandescent electric lights grouped round the Mercury Lamp; this constitutes artificial heliotherapy. Treatment should be commenced with an exposure of one minute with the lamp at a distance of three feet; this may be gradually increased up to an exposure of fifteen minutes three times a week, but it is advisable before commencing treatment to test the sensitivity of the patient by local application to a small area of the skin of the forearm through a hole in a protective covering. The Kromayer Lamp is a water-

cooled lamp with a quartz window and is most effective for local application. The Carbon Arc has the advantage that the biological action of the ultra-violet rays is increased by the presence of heat and visible rays, being thus more like the natural rays of the sun. For treatment the patients in a nude condition sit around the lamp at distances of three feet or more, the eyes being protected by dark glasses. Exposure commences with about fifteen minutes, increases up to two hours or more per day; pigmentation of the skin is rapidly produced. The Tungsten Arc.—This has been largely replaced by the Mercury Vapour lamp, as it has the disadvantages of the expense of the Tungsten poles, spluttering an emission of sparks, and is only applicable to limited areas.

DISEASES BENEFITED BY LIGHT TREATMENT:—

RICKETS.—When sunshine is not available, exposure to the Carbon Arc is unquestionably very effective; it not only improves the general health and standard of nutrition, but also increases the rate of growth; it has also been used for the antenatal treatment of expectant mothers in localities where rickets is prevalent.

SURGICAL TUBERCULOSIS AND LUPUS.—It is of great service in these conditions in the absence of natural heliotherapy, and should be administered by either the Carbon Arc or the Mercury Lamp under conditions approximately to the open air as nearly as possible.

PULMONARY TUBERCULOSIS.—Great care and judgment is required in these cases; it should not be used when there is any pyrexia but chronic and healed cases frequently benefit.

FIBROSITIS AND MUSCULAR RHEUMATISM.—Pain is relieved in these cases and the absorption of fibrositic indurations is promoted.

SKIN DISEASES.—Especially coccal infections and chilblains. High blood pressure and convalescence from acute conditions are all benefited by this treatment.

THE FINSEN LAMP.—The principle of the Finsen Lamp treatment of Lupus was focusing the sun's rays through water-cooled lenses which were pressed on the skin to render it bloodless, thus allowing the rays to penetrate. The Carbon Arc was subsequently substituted for the inconstant sunlight. It has however been recently discovered that simultaneous irradiation by the Carbon Arc of the whole body greatly accelerates results, thus pointing to the fact that the general is more important than the local effect.

PROTEIN SHOCK TREATMENT OR NON-SPECIFIC PROTEIN THERAPY

There is a great deal of evidence to show that the intravenous injection of a 50 c.c. of a 10 per cent. solution of peptone, 50 M dose of typhoid vaccine or 5 to 10 c.c. of sterilized milk intramuscularly, produces a reaction which leads to a beneficial result in a number of infectious diseases, particularly in septicaemia, puerperal infection, rheumatoid arthritis, coliform infections of the urinary tract, asthma, skin lesions such as psoriasis and pemphigus.

During treatment the patient is kept lying down having been prepared by a purgative and light diet. The injection is given slowly into a vein, and in from one to six hours there is a feeling of malaise, and a rise of temperature from 102° to 104° . If the reaction is excessive with dyspnoea and vomiting, it is controlled by 1/100 gr. of Atropine and 5 m of 1 in 1000 Adrenalin.

When the patient has settled down in 3 or 4 days' time the injection is repeated; the number of injections will depend on the result obtained and condition of the patient.

The way in which immunity is helped by this treatment is unknown, but Lord Horder considers that it may prove to be nearer the mechanism by which natural immunity is achieved, than is at present supposed. In many cases non-specific vaccine therapy is as efficacious as the use of specific vaccines.

RADIUM THERAPY

By radio-activity or the spontaneous disintegration of the element Radium, three kinds of rays are given off: α , β , γ . Alpha rays are helium atoms positively charged. Beta particles are single negative electrons. Gamma rays are not material bodies; they are energy waves like light and X-rays, but of a shorter wavelength. Alpha rays although representing 92 per cent. of the energy of radium have practically no power of penetration and are of no therapeutic value. Gamma rays represent 4.8 per cent. of the energy; they are very penetrating rays never emitted alone, but always with Beta rays, and in passing through the body they give rise to secondary Beta rays also of therapeutic value.

The action of radium is similar to that of X-rays. The Beta rays, corresponding to soft rays from the X-ray tube, can produce a limited superficial reaction, but are usually cut off by filtration through 0.6 mm. of platinum which absorbs 99.0 per cent. of Beta particles, so that the effect of the Gamma rays alone is obtained and it is the Gamma rays which produce the therapeutic changes.

EMANATION OR RADON.—Radium emanation or Radon gas is the first product of the disintegration of radium, the quantity being measured in equilibrium with 1 gram. of radium and known as the 'Curie'. While it takes radium 1,700 years to lose 50 per cent. of its weight, the radio-activity of radon has completely gone in 80 days.

TREATMENT BY RADIUM.—It is most important that the general practitioner should realize that radium treatment is a highly specialized branch of medicine that can only be undertaken by specialists at centres which are equipped for the purpose. At the same time it is essential that he should have a clear conception of the possibilities of radium therapy and be able to co-operate in the preliminary treatment and post-radiation care of the patient.

Methods of Application:—

1. CAVITY METHOD.—The radium is introduced into such cavities as the mouth, rectum and vagina, either continuously or interruptedly.
2. INTERSTITIAL IRRADIATION.—By which the radium is introduced into the lesion to be treated, and is spoken of as 'needling' which means the systematic distribution of containers, each containing a small quantity of radium in and around the affected area.

3. SURFACE APPLICATION.—The radium is distributed on the outer surface of a plaque of paste, wood or sponge rubber and applied continuously or intermittently over long periods.
4. BOMB OR BEAM THERAPY.—This requires from 1 to 4 grm. of radium at the cost of approximately £10,000 per gramme. It has the advantages of great powers of penetration, depth dosage is increased, and an otherwise inaccessible tumour can be treated. Apart from the economic question, it is theoretically the method of choice, and while up to now it has not fulfilled expectations further improvements are probable.

THE SCOPE OF RADIUM THERAPY.—While the principal field of use is for malignant disease there are a number of non-malignant conditions which benefit by this treatment which include:—

1. SKIN DISEASES.—Lupus Erythematosus which defies all other means, Pruritus with leukoplakia, Keloid, Papillomas and Naevi especially cavernous naevi, better results being obtained than with any other form of treatment.
2. TUBERCULOSIS.—While Lupus Vulgaris of the skin is best treated by heliotherapy, Lupus of the fauces and palate is much improved by radium, also tubercular glands.
3. UTERINE DISEASE.—The hæmorrhage of fibroids and intractable chronic metritis will at times react to radium thus avoiding operation.
4. BLOOD DISEASES.—While the ultimate prognosis is bad, radium treatment especially in Myeloid Leukemia can cause an improvement in the patient's general condition, with reduction in the number of leucocytes and the size of the spleen.
5. MALIGNANT DISEASE.—In the treatment of cancer radium is in a state of rapid evolution and progress, so that the methods advocated are continually changing. It is important for the practitioner to realize that in the treatment of cancer there are now two opposing methods—Radium and Surgery, while it is true that there are classes of cases in which radium or surgery is best adapted; there is a large field in which a combination of the two is the best method.

Dr. Ward, Director of the Radium Institute, considers that Radium Therapy can be regarded as the method of choice in the following seven groups:—

1. EPITHELIOMA OF THE SKIN.—Radium has a powerful effect on epidermal cancer; of all varieties of Rodent ulcer treated at the Radium Institute 77 per cent. are cured, and the cosmetic results are superior to those of surgery or X-rays. Carcinoma of the anal canal, hypertrophic growths of the penis and epithelioma of the vulva are all well treated by radium.
2. CANCER OF THE MOUTH, jaws, cheek, tonsil, pharynx and nose vary in their degree of malignancy and radio-sensitivity. Some are treated with radium alone, others with a combination of radium and diathermy excision. Cancer of the tongue can be permanently cured by interstitial radiation. As regards glands in the neck, every surgeon of experience knows how disastrous it is to interfere unless complete removal is possible. The best treatment is block dissection plus irradiation.
3. CARCINOMA OF THE UTERUS.—If the disease is limited to the body of the uterus, surgery gives the best results. But in the case of the cervix more and more cases are being treated by radium which would previously have been treated by Wertheim's operation and with increasingly encouraging results more especially when combined with X-rays. It can be said of radium that in treatment of carcinoma of the cervix it has done more to alleviate and prolong life than in any other group of cancer patients.
4. BREAST CANCER.—The question of operable cases is not as yet definitely settled, but radical operation, with removal of a wide area of skin and the axillary contents, would appear to be the best with the possible exception of cases with thin flat breasts
 In inoperable cases even those so far advanced as to have fungating growths and ulcerating surfaces heal and remain healed, the progress being arrested for years. Supraclavicular and axillary glands should never be excised but treated with radium.
5. SARCOMA.—In melanotic sarcoma radium is useless, and in the case of bone and fibro-sarcomata from connective tissue it cannot be said to be

satisfactory and X-rays are more generally used. There is more hope in lympho-sarcomas, sarcoma of the tonsil and that common condition in India, sarcoma of the upper jaw.

6. DISEASES OF THE EYE.—Radium is useful in tumours growing from superficial parts of the eye as the conjunctiva and cornea, but as a primary measure is not applicable to sarcoma of the choroid and deep orbital tumours.

7. AS A PALLIATIVE MEASURE.—Radium has its widest range of usefulness, in inoperable cases which formerly died under miserable conditions, with foul discharge and profuse hæmorrhages, but now succumb in comparative comfort from secondary deposits. Pain is relieved and the patient's general condition improves with a prolongation of life. In carcinoma of the rectum colostomy is often avoided and in cancer of the mouth the dysphagia is relieved.

The practitioner can co-operate before the patient is taken over for treatment by the radium specialist by improving the patient's general condition, starting anti-syphilitic treatment in cases with a positive Wassermann, and, more important, reducing any inflammation and sepsis of a growth, as both these factors considerably reduce radio-sensitivity. Subsequent to the treatment the practitioner should treat the anorexia resulting from the breaking down of the tumour, any local conditions of the skin; remove radon seeds and regularly report the local and general condition of the patient to the Radium Centre; the full effect is usually not seen until two months after the irradiation.

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SPECIFIC THERAPY*Revised May, 1934*By **JOHN W. H. EYRE, M.D.**

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In diseases of bacterial origin, the disease-process is the expression of an interaction between the infecting agent and the body tissues. The contribution of the micro-organism to this interaction is the production of the specific chemical poisons (Toxins) incidental to the life of the bacterium.

Toxins are of two kinds: those existing in the bodies of the bacteria and set free only by their disintegration or solution Endotoxins, and those secreted into the medium in which the bacteria thrive Exotoxins. The invasion of the body by living bacteria leads to the production of a series of protective substances (Antibodies) of highly complex nature which act beneficially.

This beneficial action is either exerted by neutralization of the exotoxins (Antitoxins), by direct destruction of the bacteria (Bacteriolysins), or by stimulation of the leucocytes to phagocytosis (Opsonins). Specific therapy has, as its object, the artificial increase of these antibodies. To supply ready-made antibodies is to confer passive immunity; to stimulate the manufacture of antibodies by the patient is to confer active immunity. Passive immunity is conferred by the employment of immunized serum derived from other animals. Active immunity is conferred by the employment of bacterial vaccines or, in some cases, the toxins (Toxoids) of bacteria in safe doses.

Sera are produced by the inoculation of suitable animals with (a) toxin or (b) killed or living bacteria in increasing numbers, or increasing virulence, until the blood serum of the animals possess high (a) antitoxic or (b) bactericidal value.

A bacterial vaccine is a suspension in isotonic (normal) salt solution of micro-organisms obtained in bulk and free from exotoxin. Thus, a suspension in normal saline of the bodies of the micro-organisms so obtained, is virtually a preparation of the endotoxins of the micro-organism.

The toxins or modified toxins (Toxoids) of bacteria are also used to obtain active immunization, *e.g.* scarlet fever and diphtheria.

Immune sera act rapidly, but their action is transient; vaccines and toxoids act slowly, but their action is more pro-

longed. Immune sera supply important substances that are lacking in the body, and they probably do not require much active response on the part of the tissues in order to produce their effects; vaccines and toxoids depend for their action upon a latent power in the tissues of producing antibodies, when specifically stimulated to do so.

VACCINE THERAPY

Vaccine Therapy is often spoken of disparagingly, but if efficiently carried out with due regard to all the factors involved, the results are at least 75 per cent. satisfactory, but it is not a simple and easy matter and frequently demands much thought and patience on the part of the physician; due appreciation must be given to the underlying difficulties and cause of failure.

The following are the chief causes of failure:—

1. Neglect to consider the patient's general condition.

(a) The patient may be unable to react on account of the temporary exhaustion of the normal antibody, and this would be shown in an examination of the blood by a Leucopenia, or the blood may show a Leucocytosis revealing a septic focus requiring surgical treatment; a lymphocytosis would suggest a condition of Leukæmia or possibly Pernicious Anæmia.

A reduction in the number of the red corpuscles with a still greater reduction of the Hb, so that the colour index is about 0·7 would indicate a secondary anæmia, requiring treatment by iron, arsenic and possibly liver before the commencement of vaccine therapy.

(b) Biochemical examination may reveal endocrine or metabolic defects. Thus a low blood sugar would show a hypofunction of the pituitary, thyroid or suprarenal. A glucose tolerance test might show a defective hepatic or pancreatic metabolism. Increased uric acid and non-protein nitrogen might reveal a parenchymatous nephritis. These conditions would require appropriate treatment before vaccine treatment could hope to succeed.

(c) Allergic conditions, as shown by a marked Eosinophilia, and other signs of this condition would interfere with treatment.

(d) Persistence of Infective Foci is another cause of failure, and this may amount to a dangerous condition if the focus is closed as in the case of the mastoid, accessory sinuses or empyema. As unless there is a free exit for discharges, the focal reaction in a closed focus may give rise to a general infection. A focus such as this must be dealt with surgically to avoid repeated re-infection.

Care must be taken to provide the right antigen, by obtaining in the first place a satisfactory specimen from which the organism, pathogenic to the patient, is isolated. All possible sources of infection should be examined, and the method of selective culture of Solis Cohen used as being the only practical method available for obtaining evidence of the pathogenesis.

II. DOSAGE.—This is important as the Idiosyncrasy to vaccine dosage may be as marked as the Idiosyncrasy to drugs such as antipyrin, aspirin and iodoform. Apart from prophylactic treatment, such as typhoid inoculations, it is impossible to fix a standard dosage as the infection may be general or local, quite apart from the varying susceptibility of the patient.

Consideration must be given to the Hypersensitive and Insensitive types of cases. The former are usually of long standing due to a latent focus, and may be so intolerant of such small doses as to make vaccine treatment inadvisable. The possible methods of dealing with these cases are removal of the active focus, desensitization by a detoxicated vaccine, the use of sensitized autogenous vaccine, or the patient having become sensitive to his own organism, replacing the autogenous by a stock vaccine.

The majority of cases in the Insensitive type are found in cases of furunculosis and less often in chronic rheumatic and catarrhal conditions. The usual doses are quite inadequate in these cases, and in some cases of furunculosis three or four times the maximum dose must be used. But in the type of case showing marked debility, the blood forming centres will require stimulation, or a donor to give an autogenous immune serum, or a whole blood immune transfusion to be followed by small doses of sensitized vaccine.

III. TYPE OF VACCINE.—This is another important consideration, while a stock vaccine can be used for subacute or chronic conditions, an autogenous vaccine is usually essential for the treatment of acute conditions. Or one of the special varieties of vaccine to be subsequently mentioned may be necessary.

IV. DURATION OF THE TREATMENT.—Many failures are due to insufficient duration. While a recent acute case may be cured with a few inoculations, a chronic infection may require regular treatment for at least a year, perhaps at intervals for two or three years, especially in some cases of hæmolytic streptococcal infections. But in all chronic conditions it must be remembered that it is even more important to treat the associated and resulting changes of metabolism than the actual infection.

KINDS OF VACCINES

1. ORDINARY VACCINES.—Are simply suspensions of the killed bacteria, and the dose is expressed as the number of bacteria injected in so many millions. They give the best and most lasting immunization, but demand response on the part of the patient's tissues. These vaccines may be stock, *i.e.* prepared from any suitable case, and kept in readiness, or autogenous, when the culture is taken from the actual patient on whom the vaccine is to be used.

The only vaccine containing living organisms is Vaccine Lymph. (*Vaccinum Vaccinæ B.P.*).

2. SENSITIZED VACCINES.—Are vaccines in which an emulsion of the organisms is left in contact for several hours with the serum of an animal immunized against the same organism. The specific antibody in the serum becomes attached to the micro-organisms, and when injected is ready for immediate phagocytosis. These vaccines are therefore of special use in acute infections, when rapid immunization is of first importance. They should be given early in the case in large doses and can be repeated at 24-hour intervals.

3. DETOXICATED VACCINES.—Are ordinary vaccines treated by chemical reagents so that the endotoxin has been removed from the micro-organisms. They do not require specific anti-bacterial serums in their preparation. They are used in the same type of cases in which sensitized vaccines are used, and at the commencement of treatment. Their dosage interval is intermediate between sensitized and ordinary vaccines.

4. DEFATTED VACCINES.—It has been thought that the therapeutic failure of some vaccines may be due to the protection of their protein by lipoidal substances, and defatted vaccines have had these substances removed by acetone and formalin.

5. REINFORCED VACCINES.—This is a vaccine containing a 5 per cent. solution of Sodium Nucleinate, with the object of stimulating the tissues of a patient with lowered vitality, and is considered of value in these cases; it can also be used with ordinary sensitized or detoxicated vaccines.

6. ORAL VACCINES.—The oral administration of vaccines so much advocated in France is generally considered by English authorities to be useless.

PREPARATION OF VACCINES

The first step in the preparation of a vaccine is to isolate in pure culture the causative micro-organism of the disease to

be treated. This is essential to success and is the foundation upon which all vaccine therapy is based. The method of achieving this object is to inoculate tubes or dishes of culture media with a portion of the exudate, secretion or tissue concerned, as free as possible from contamination, and to incubate them at body heat. The organisms multiply and form colonies. Fresh sub-cultures may then be made, so as to isolate the required organism as a pure strain. The colonies of the growth are scraped off the surface of the culture medium, and transferred to normal salt solution, so as to form a uniform emulsion. Standardization is effected by counting the bacteria in the emulsion by means of a Thoma-Zeiss Pipette, as used for blood counts or by measurement of opacity. In the majority of laboratories, the emulsion is heated to 60°C., for an hour, to ensure sterilization. In others, heat is avoided, the sterilization being secured by the addition of a little antiseptic (*e.g.* 0.1 to 0.3 per cent. trikresol). These methods effect the death of the micro-organisms. After being standardized (*e.g.* 1,000 million in 1 c.c., etc.), the vaccine is either put up in small bottles with paraffined rubber tops, which can be pierced by the hypodermic syringe needle as necessary, or it may be diluted to yield appropriate doses per cubic centimetre (*e.g.* 5, 10, 25 million, etc.) and transferred to small glass ampoules which are sealed in the blow-pipe flame.

DOSES OF VACCINES

In the vast majority of acute infections, vaccines should not be used, on account of the great danger of the negative phase. Not only the original dose, but also the intervals between successive administrations, must be carefully regulated by reference to the constitutional reaction of the patient.

The following doses refer to carefully prepared autogenous vaccines; stock vaccines prepared by commercial houses are less potent and the dose suggested by the manufacturers should be employed:—

<i>Name of Vaccine</i>	<i>Approximate Doses</i>	<i>Interval between Doses</i>
Acne Bacillus	... 5 M initial, increasing to 100 M.	7 to 10 days.
Acne B.+Staphylococcus	... Acne 5 M initial, Staphylococcus 100 M.	7 days.
Catarrh (Combined)	... 25 to 250 M.	For Treatment 10 days. For Immunizing 8 months.
Cholera (Prophylactic)	... I. Dose 1,000 to 5,000 M. II. Dose 2,000 to 10,000 M.	After 5 to 6 days.

<i>Name of Vaccine</i>	<i>Approximate Doses</i>	<i>Interval between Doses</i>
Coli Bacillus ...	Acute 2½ to 10 M. Chronic 250 to 500 M.	4 to 7 days. 7 to 10 days.
Friedlander's Bacillus ...	5 to 125 M.	7 to 10 days.
Gonococcus ...	Acute 1 to 5 M. Chronic up to 100 M.	3 to 5 days. 10 to 14 days.
Hay Fever ...	According to Reaction. For intensive Treatment.	7 to 10 days. Every day.
Influenza Bacillus ...	Prophylactic :— I. Dose 250 M. II. Dose 500 M.	10 days.
	Curative :— Acute 5 to 25 M. Chronic up to 100 M.	7 to 10 days.
Micrococcus Catarrhalis ...	25 to 100 M.	5 to 7 days.
Micrococcus Melitensis ...	10 to 250 M.	5 days.
Pneumococcus ...	Acute 5 to 50 M. Chronic up to 500 M.	2 days. 7 to 10 days.
Staphylococcus ...	Initial Dose 100 M. Up to 1,000 or even 5,000 M.	7 to 10 days.
Streptococcus ...	Acute 2½ to 10 M. Chronic up to 50 M.	3 to 5 days. 7 to 10 days.
Tuberculin T.R. ...	Curative :— 0.00001 c.c. upwards.	10 days to 14.
Tuberculin B.E. ..	Curative :— 0.00001 c.c. upwards.	10 to 14 days.
Tuberculin T.A. ...	Diagnostic Subcutaneous : 0.2 c.mm., 1 c.mm., 5 c.mm., 10 c.mm.	A rapid increase in the size of the dose at short intervals, until the signs of reaction, if any, are produced.
	Diagnostic Cutaneous :— Von Pirquet.	
Typhoid and Para-Typhoid . .	Prophylactic :— I. Dose 500 M.T. with 250 M each Para. A & B. II. Dose 1,000 M.T. with 500 M each Para. A & B.	Not less than 10 or more than 14 days.
Typhoid Para. and Cholera	As above with addition of Cholera : I. Dose 5,000 M. II. Dose 10,000 M.	Not less than 10 or more than 14 days.
Whooping Cough ...	5 to 500 M. According to Age.	4 to 5 days.

VACCINE LYMPH

Vaccination is the inoculation of lymph containing the virus of *Vaccinia* or Cow-pox. This was introduced in 1798 by Jenner as he believed there was a close relation between cow-pox and small-pox. This however was not scientifically proved until Copeman in 1902 inoculated the virus of small-pox into a monkey, and a calf vaccinated from the monkey developed cow-pox.

Vaccine lymph is prepared by vaccinating the abdominal surface of specially selected and examined calves, which have been kept in quarantine. Although precautions are taken to maintain sterility, the lymph is not sterile and tests have to be applied to every batch to see that no dangerous bacteria are present; the dangerous organisms are those belonging to the gas-producing anaerobes, such as *B. Perfringens* and haemolytic streptococci.

Glycerine is added as a disinfectant and in time destroys the greater number of the less harmful bacteria, but no batch of lymph is passed for use, until the total number of bacteria has fallen to 5,000 per c.c. It is then put up in glass capillary tubes and stored at 0°C. The lymph rapidly loses its potency when stored at higher temperatures.

The Therapeutic Substances Regulation, Great Britain, 1927, requires a printed label to be attached to the effect that the storage temperature must be below 10°C., otherwise the potency cannot be guaranteed beyond seven days. The potency of lymph used in England is very high, as it is required by law that the degree of potency shall be such that the characteristic skin lesions of *Vaccinia* are produced when diluted one-thousandth-fold.

PREPARATION OF IMMUNE SERA

Sera are usually prepared by injecting the exotoxins of the particular bacteria into healthy horses in gradually increasing amounts. The horses are carefully chosen, and, before selection, they are proved by the Mallein Test to be free from glanders. In the case of diphtheria antitoxin, the strength of the exotoxin used for inoculation is ascertained by estimating its lethal effect on guinea-pigs of standard weight. The progress of the horse's immunization to the exotoxin is tested from time to time, and when the content of the horse's serum in antitoxin has reached a satisfactory point, the horse is bled. The blood, collected with aseptic precautions, is allowed to clot, and the serum which separates out, constitutes the 'antitoxin' required. This antitoxin serum is tested for sterility and absence of any contamination or impurity, and then standardized.

For the production of some sera, horses are inoculated with bacteria themselves (Endotoxin) instead of with their Exotoxin. In the case of bactericidal sera, such as anti-pneumococcus serum, various methods have been employed from time to time, in order to procure a potent remedy. One method is to inject the horse with cocci, whose virulence has been raised by passage through susceptible animals. Another is to use cocci, derived directly from the human host, without loss of virulence by sub-culture. Living cocci are sometimes injected after the horse has been partially immunized by receiving graduated doses of dead cocci, with the hope that, by this means, a serum will be obtained which is richer in antibody.

PREPARATION OF TOXINS AND TOXOIDS

The filtrate of a culture, in which a strain of bacteria has been growing, contains the toxins of the organism and such a preparation, after testing for sterility and potency, is used in obtaining active immunization in scarlet fever. In the case of diphtheria immunization, the toxin is modified and reduced in toxicity (Toxoid) by means of formalin and heat, so that several times the human dose produces no symptoms in guinea-pigs but makes the animals immune. It is, therefore, atoxic but still antigenic, *i.e.* of good immunizing power. In practice, it has been usual in the past to add a little diphtheria antitoxin to the toxoid (Toxoid-Antitoxin Mixture). Diphtheria toxoid, without any added antitoxin, is now, however, frequently used.

DOSES OF ANTITOXINS

DIPHTHERIA.—Cases presenting the clinical picture of Diphtheria should receive the Antitoxin at once, before a bacteriological diagnosis.

<i>Stage of Disease</i>	<i>Dose</i>
Mild case seen the first day, with exudate limited to one tonsil.	2,000 units.
If both tonsils	5,000 to 8,000 units.
If the case has been running 2 or 3 days.	Double the above.
When the membrane has extended to the soft palate, pharynx, nasopharynx or nose, and when cervical, glandular and periglandular swelling is extensive.	12,000 to 16,000 units, two doses according to the degree of intoxication.
*Laryngeal Diphtheria: no distinct and permanent obstruction.	10,000 to 15,000 units.
More severe and obstruction becoming pronounced.	Up to 24,000 to 48,000 units, repeated on two or more successive days.

Note.—In all cases, it is desirable for the primary injection to be as near as possible the total amount the case will require. There is no good reason to believe that large doses are dangerous, or more so than small. In treatment, strict recumbency, as in plague cases, must be enforced.

DIPHTHERIA ANTITOXIN. METHOD OF ADMINISTRATION.—The earlier it is given the more certain its curative effect.

Intramuscular is more effectual than subcutaneous; in severe advanced and hæmorrhagic infections, the antitoxin should be given intravenously undiluted at blood heat, very slowly through a fine needle. Measures having been taken against collapse, 50,000 or more units may be given in this way supplemented by 20,000 units intramuscularly. In cases which do not respond injection is repeated in 12 hours. It must be realized that the rise of antitoxin in the blood after intramuscular injection is very slow, only 11 per cent. after 6 hours and 50 per cent. after 24 hours, with subcutaneous injection it is even slower.

ANTI-MENINGOCOCCAL SERUM.—*See* Index of Treatment: Cerebrospinal Meningitis.

TETANUS.—The principal use is in prevention; as for, when the disease has fully developed, the serum can only neutralize the toxin in the blood and lymph.

PREVENTIVE.—Subcutaneous injection will prevent development in the great majority of infected cases. Dose: 1,500 units adult, 1,000 units child. A second injection, within 7 days of the first, will ensure absolute protection.

CURATIVE.—Adult, at least 15,000 units. If available, 25,000 units would be better. This injection should be given intrathecally, as a subcutaneous injection is not wholly absorbed for 48 hours.

Note.—Tetanus serum usually contains about 500 units per cubic centimetre.

TETANUS ANTITOXIN.—Recent work by Paterson in Australia indicates the value of very large doses. On admission 200,000 international units are given into a vein, with 80,000 units intramuscular. The intravenous dose is repeated in 12 hours, and subsequently at 24-hour intervals. The intramuscular injection is repeated every 4 hours at first and then gradually reduced. Of 26 cases treated in this way 19 recovered. *See* also Index of Treatment and the article—Recent Advances in Medicine.

ANTI-DYSENTERY SERUM (SHIGA).—The general method of preparation is the same as that of diphtheria antitoxin. It was much used during the War, and there is general agreement as to its value, the death-rate is low if given early. The dose is 25 to 100 c.c., either intramuscular or intravenous; the most potent preparation contains 5,000 units per c.c. but the usual strength is 1,000 units per c.c.

GAS-GANGRENE ANTITOXIN (PERFRINGENS).—Gas-gangrene is a gangrene of the tissues due to invasion by the gas-producing *Bacillus Welchii* or *B. Perfringens*. It was a serious cause of mortality during the War from wound infection; it is a common cause of peritonitis and paralytic ileus after abdominal operations. It has a prophylactic use in acute intestinal obstruction, when 4,000 units are given into a vein before operation, followed later by a similar dose into muscle. For curative purposes 10,000 to 20,000 units are given into a vein, and subsequently smaller doses until the gut has recovered its normal tone, and regular evacuations of the bowel occur.

ANTI-PNEUMOCOCCUS SERUM.—There are four types of Pneumococci. Types 1 and 2 are well defined, Type 3 is less well defined, and Type 4 is a collection of organisms, which cannot be placed under either 1, 2 or 3.

A serum can be prepared from each type separately or a polyvalent serum, *i.e.* prepared from a mixture of the types. While the serum has been used for many years, it has been more extensively used since Felton discovered that simple dilution with distilled water of Type 1, pneumococcus horse serum, caused a precipitate which contained 80 per cent. of the protective power of the serum.

Concentrated anti-pneumococcus serum has been extensively used for the treatment of pneumonia due to Type 1 and Type 2 pneumococci respectively. Cecil and Sutcliffe published figures in 1928, comparing 441 patients injected with 444 patients not injected over the same period. The death-rate in the former was 30 per cent. as compared with 89.2 per cent. in the latter. Moreover good effects on the temperature and pulse rate were observed in many cases.

The best procedure is to give a polyvalent serum immediately and to take a specimen of sputum in order to determine the type of pneumococcus responsible for the infection.

The sputum is rubbed up with a little sterile broth and injected into the peritoneal cavity of a mouse; after six hours a little exudate is withdrawn, and tested against specific grouping serum of each type for clumping. The type which is infecting

the patient being thus determined the corresponding monovalent pneumococcus serum is used for treatment.

ACUTE BACILLARY DYSENTERY.—A polyvalent serum, such as Shiga's, should be given, as soon as possible, in those cases in which a complete etiological diagnosis cannot be made.

Other sera are those of Lister and Pastour Institutes and Kruse's Serum.

DOSE.—50 to 70 c.c. adult; 25 c.c. infant. Twice daily and continued over several days if the attack is severe.

If urticarial eruptions, and severe pains in the joints, are caused, give Calcium Chloride 15 to 30 gr. See also Index of Treatment.

PLAGUE. PREVENTIVE TREATMENT.—Is, much the most important. Haffkine's Prophylactic is a broth culture of the bacillus, killed by heat and preserved by the addition of 0·5 per cent. Carbolic Acid.

The protection is developed in 24 hours, and lasts about 18 months (Bannerman).

The full adult dose is either 3 c.c. or 4 c.c., according to the period which has elapsed since the vaccine was prepared.

Age.	Full dose 3 c.c.	Full dose 4 c.c.
From 10 days to 1 year ...	·15 c.c.	·2 c.c.
1 year to 2 years ...	·6 c.c.	·1 c.c.
2 years to 5 years ..	1·2 c.c.	1·6 c.c.
6 years to 11 years ...	1·8 c.c.	2·4 c.c.
12 years to 15 years ...	2·4 c.c.	3·2 c.c.
16 years to 50 years ...	· 8·0 c.c.	4·0 c.c.

CURATIVE TREATMENT.—The effect is not great; a lowering of the case mortality by about 10 to 20 per cent. is the utmost that can be hoped for at present. Yersin's Serum is most used: The dose is 100 c.c., part being injected into the region draining into the affected glands, and part given intravenously.

SEPTICÆMIA. ANTI-STREPTOCOCCIC SERUM.—In any form of septicæmia, as early as possible, the injections should, when possible, be made at the site of inflammation (as in erysipelas) so as to produce a good local effect. It is highly polyvalent, usually supplied in 10 c.c. phials. Dose: 80 c.c., repeated the same day, and subsequently 80 c.c. daily.

The result is uncertain; in some cases, but unfortunately not in all, the injection is followed by a marked and immediate benefit.

The question as to whether a serum or vaccine should be used, cannot be definitely settled at present. In severe and rapidly progressing cases, such as post-mortem wounds, serum should be given immediately, and the preparation of a vaccine from the discharge at once taken in hand. The use of minute doses of stock vaccine, 5 to 10 M, may be considered. There appears to be no reason why serum and vaccine should not be used at one and the same time.

Special Anti-Streptococcic Sera have been used for puerperal fever, erysipelas, rheumatic fever, endocarditis and scarlet fever.

Snake-bite.—See Treatment of Snake-bite.

SERUM FOR HAY FEVER.—Dunbar, by injecting horses with the toxin extracted from the pollen of various Graminaceæ, has obtained an antiserum which is stated to entirely relieve the troublesome symptoms of Hay Fever. The serum is applied to the eyes, and a solid powder is prepared for the nose. The remedy is sold under the name of 'Pollantin'.

NORMAL SERUM.—For alimentation, Normal Horse Serum, heated to 60 deg. C. for half an hour, may be used to replace for a short time or to supplement gastric or rectal feeding. Dose: Adults 100 to 150 c.c., Children 30 to 50 c.c. Subcutaneously, 20 c.c. to 40 c.c. daily.

Horse Serum injections are sometimes beneficial in many diseases, such as arthritis, gonorrhœal arthritis, asthma, and broncho-pneumonia.

CANCER SERUM.—Various sera have been prepared for malignant growths. The most recent is that of Schmidt, but the clinical reports are not encouraging.

COLEY'S FLUID.—Prepared by cultivating the Streptococcus of Erysipelas and the Bacillus Prodigiosus in broth, and heating to 58 deg. C. for one hour. Used in the treatment of malignant growths, especially sarcomata, the dose being $\frac{1}{2}$ to 1 m, injected into the neighbourhood of the tumour. The dose, guided by the amount of reaction, is gradually increased.

ANTI-THYROID SERUM.—This is not advised, as it has been found to be useless.

CAUTION.—Enquiry should be made if the patient has previously suffered from anaphylaxis, before any serum is injected.

and it should be administered with great caution to asthmatic patients.

Calcium Salts are prophylactic against serum rashes.

SCHICK TEST TOXIN

This test is used to determine as to whether a person is susceptible or immune to diphtheria. This depends on the amount of diphtheria antitoxin present in the blood and tissues, if it is less than a certain amount the patient is susceptible, but can be made immune by the use of diphtheria prophylactic.

The test consists of injecting into the skin of the forearm a small accurately estimated amount of diphtheria toxin (the dose is always 0.2 c.c. in volume). If the patient has not enough antitoxin in his tissues to neutralize the injected toxin, a reaction takes place in about 24 hours, which consists of an area of redness around the site of inoculation. The patient is then said to be susceptible or Schick positive. If there is no area of redness, is immune or Schick negative.

The percentage of people immune has been found to vary a good deal at different ages. In cities about 80 per cent. of the adult population are immune. With children the percentage of immunity rises from 10 per cent. at one year, to 20 per cent. at three years, 40 per cent. at six years, 60 per cent. at about ten years; these figures, however, only apply to thickly populated districts.

SCHICK CONTROL.—As Schick toxin is diphtheria toxin it follows that it is a broth filtrate containing the constituents of the broth as well as diphtheria toxin and toxoid. As these non-specific substances in some people cause a reaction similar to the specific toxin, it becomes necessary to distinguish between the two. This can be done by heating some of the diphtheria toxin to 70°C. for five minutes which destroys it. An amount of this destroyed toxin equal to the Schick toxin is injected into the opposite forearm, and the two sites compared for a few days. The patient is then only said to be Schick positive, when the area of inflammation produced by the Schick toxin is unquestionably greater than that produced by the Schick control.

Note.—This injection should be made into not under the skin, with a fine needle, the bevelled point of which should only be 1 mm. long.

DIPHTHERIA PROPHYLACTIC.—Is prepared in several different ways, but the strength is adjusted so that 1 c.c. is given

by three hypodermic injections at intervals of three weeks. The majority of people become Schick negative after the third injection, and the immunity lasts for a very long time. The value as a preventive measure in institutions has been repeatedly confirmed.

SCARLET FEVER

Attempts have been made to conquer this disease on the same lines as in the case of diphtheria; at present it is a relative early stage, but further progress is likely to be made. There are four points to be considered:—

1. **DICK TEST TOXIN AND DICK CONTROL.**—The Dick test toxin, Dick control and method of preparing the test correspond with Schick reagents, and the method used in the case of diphtheria.

The Dick test toxin is prepared in the same way as the scarlet fever toxin used for immunizing horses, *i.e.* a sterile filtrate from a broth culture of the hæmolytic streptococcus of scarlet fever.

2. **SCARLET FEVER PROPHYLACTIC.**—Is used to render immune those found by the Dick test to be susceptible to scarlet fever; while it has the same object, scarlet fever prophylactic is merely a diluted form of scarlet fever toxin exactly like Dick test toxin, and is measured in terms of skin test dose, being about one-sixth of the amount of toxin ordinarily used in the Dick test. The first injection is 500 skin test doses, followed by doses of 1,000, 5,000 and 10,000 at intervals of one week.

The Dick test and scarlet fever prophylactic are of value in immunizing the nursing staff of fever hospitals.

3. **SCARLET FEVER ANTITOXIN.**—Is prepared in a similar manner to diphtheria antitoxin. A toxin being first obtained by growing a special strain of the scarlet fever streptococcus. Antitoxin is injected either subcutaneously, intramuscularly or intravenously in doses of from 10 to 50 c.c. in the early stages of the disease.

4. **SCHULTZ-CHARLTON TEST.**—This is to diagnose a rash which may or may not be that of scarlet fever. An intradermal injection is made of 0.2 c.c. of scarlet fever antitoxin. If the rash is due to scarlet fever and is not more than 60 hours old, the antitoxin will cause the rash to disappear around the site of injection, the bleaching beginning about eight hours after injection and lasting for a day.

KEEPING QUALITIES OF SERA AND VACCINES

In the case of the antitoxin sera, both unconcentrated and concentrated, *viz.* those prepared for use in diphtheria, tetanus, scarlet fever, dysentery (Shiga) and gas-gangrene (*B. Wolchii*), the experimental determination of the activity can be made with such precision that the rate of deterioration can be determined with accuracy. In those cases, therefore, it can be stated with certainty that the sera, if kept under the indicated conditions of cold storage, will be of at least the stated value on the date indicated, and may be expected to deteriorate at a definite and very slow rate (not more than 10 per cent. per annum) thereafter, so that they may be used with confidence for a considerable period after the date in question.

Less quantitative evidence is accessible as to the keeping properties of typhoid vaccine. Bacteriological evidence shows that typhoid vaccine loses part of its antigenic properties in about nine months after the date given; it could, however, be used justifiably for some weeks after the date on the wrapper, if fresh supplies were not available.

In the case of the anti-bacterial sera, and of vaccines in general, the available evidence has not the same precision. The date chosen is based, however, on general observations, both of a clinical and bacteriological nature, and, as further evidence accumulates, the method of dating these preparations will, if necessary, be modified. Meanwhile, it may be said that the date chosen is well within the expectation of permanence, in the light of present knowledge.

For use in the Tropics, 'Wolcome' Brand Diphtheria Toxin for the Schick Test is issued *undiluted in capillary tubes*, in response to numerous inquiries from clinicians. Though experience indicates that, when carried and kept in cold storage, there is little risk of the toxin being rendered unfit for use before it reaches tropical parts, it must be clearly understood that this risk must be taken by the clinician, and that the toxin is issued on this condition only.

The toxin retains its full potency for many months, when stored in an ordinary room in England. At a temperature of 70°F., it is still potent after 4 to 6 weeks, but at 98°F., the toxin has lost a good deal of its potency within 1 to 2 weeks. Samples of the toxin, returned to England from India and China after a short period of storage, have been examined, and it has been found that, even after the double journey in cold storage, none was too weak to give a satisfactory Schick Test result.

The toxin, when diluted ready for use, is relatively unstable. Exposure to heat or light will materially affect it. The toxin dilution should, therefore, be used immediately after it has been prepared, and any that is left, thrown away. If kept in an ice chest, it is usually of full potency for at least two weeks.

It is wise to test a number of people at one time. Besides being economical, this affords an important control.

If in a group of people tested at one time a certain number give a positive reaction, it can be taken that the toxin dilution is acting properly. If, on the other hand, in a group of, for example, a dozen Europeans, no positive reactions were met with, it would be justifiable to suspect that the toxin was not fully potent.

The potency of 'Wellcome' Diphtheria Prophylactic and 'Wellcome' Scarlet Fever Prophylactic is retained for a lengthy period, under ordinary conditions of storage in England. In the Tropics, it would be wise to use it as soon as after receipt as possible.

HYPERSENSITIVENESS

Hypersensitiveness includes Anaphylaxis and Atopy.

ANAPHYLAXIS.—Was at first believed to be exactly opposite to immunity, but is now considered to be two stages of one reaction. It is only produced by substances which can cause the formation of antibodies. The reaction is due to some interaction which occurs between the tissues and the antigen.

The readiness with which anaphylaxis can be produced and the severity of the reaction varies greatly in different animals. Most experimental work has been done on the guinea-pigs because anaphylaxis can be more easily induced and is more violent than in any other animal. But experimental and clinical anaphylaxis are two entirely distinct conditions, it is confusion of the two which has led to the fear of fatal results from the use of therapeutic sera. It is doubtful whether anaphylaxis can be induced in a normal person. Severe and even fatal reactions in hypersensitive persons have followed a first injection of serum, but persons who show no reaction to the first injection do not acquire anaphylaxis and shew sensitiveness to a second injection.

Therefore it is with the first injection that care must be taken, and in all doubtful cases, such as those with an asthmatic history, 2 or 3 m of the serum is injected intradermally, not subcutaneously, and the formation of a small blanched area

with wheal formation watched for. In proportion as this area is marked, so is the patient's degree of liability to anaphylaxis, and if this liability is definite, the patient should be desensitized by $\frac{1}{2}$ to 1 c.c. of the serum given 2 or 3 hours before the chief dose. Children are less liable to anaphylaxis than adults.

Should alarming symptoms arise, such as collapse, give Adrenalin 5 to 10 c.c. (1 in 1,000) hypodermically.

It is important to give a second dose of serum even if it is not needed from the clinical point of view, within seven days of the first, in order to produce a condition of anti-anaphylaxis.

ATOPY.—Is an inherited hypersensitiveness which can manifest itself in a variety of ways, such as urticaria, gastrointestinal symptoms, asthma, eczema, migraine and hay fever. There is hypersensitiveness to certain proteins which occur in dust, hair, etc. Or the proteins are in food, for example, egg albumin. The skin and conjunctiva are sensitive to the exciting protein, and can be determined by skin tests; if a solution of the suspected protein is rubbed into a superficially scarified patch, a positive reaction will be shown in a few minutes by a wheal of varying size. It is due to the presence in the patient's blood of a reacting body, and is inherited probably as a Mendelian dominant character.

VASO-MOTOR REACTIONS.—The intravenous injection of Salvarsan, colloidal metals and many other substances produces a toxic reaction, which in a way is like anaphylactic reaction. These reactions were at one time thought to be due to distilled water, which had been allowed to stand; this may contain as many as 100,000 bacteria per c.c. and intravenous injection of dead bodies of bacteria certainly can produce a violent reaction. But vaso-motor reaction occurs even when water is used that was sterilized immediately after distillation.

REACTIONS FROM THE PRODUCTS OF PROTEIN BREAKDOWN.—The following are some of the more important: Peptones substances formed during the coagulation of the blood, which have a strong vaso-constrictor action and probably originate in the blood platelets. Substances formed after injury to the tissues, especially by burns or wounds. Products formed from the partial breakdown of aminoacids, *i.e.* histamine, indole, tyramine. Also from the breakdown of Lecithin, *i.e.* Choline and Neurine.

X-RAY THERAPEUTICS

As with Radium so with X-ray therapeutics, this is work for a specialist and should on no account be undertaken by the practitioner with his own X-ray set.

While in X-ray diagnosis the primary radiation from the tube, which must be of the soft variety, is required to cast clear shadows, in therapeutic work the most penetrating ray is required, the primary radiation is very small, but the results are obtained from the profuse secondary radiation set up as the rays penetrate the tissues. The modern technique is exact and dosage can be measured with great accuracy, so that a full dose can be given at one sitting or within 24 hours and is not repeated for 3 to 8 weeks.

Treatment by X-rays is divided into two methods—Superficial and Deep. In the case of Superficial Therapy the unit dose is that quantity of radiation which is given out by a tube at a constant voltage, which amount will cause erythema, and is called the 'erythema dose'. The measurement is carried out on chromoradiometers which depend on the colour changes of certain chemicals (the most commonly employed are the discs or pastilles of Sabourand coated with Barium platino-cyanide) in comparison to standard tints previously worked out to correspond with one erythema dose.

In Deep Therapy the same principle is used, but a higher voltage with a specially constructed tube, the ray being of greater penetration. The tumour being deeply placed, it is necessary to try and produce at that depth the effect of an erythema dose. The rays are heavily filtered and the central ray directed through the tumour. Knowing the time of an erythema dose, and the percentage of the dose which penetrates into the tumour, the maximum just short of an erythema dose is given in one position on the skin, and the tube must then be moved to another skin area, the incident ray again directed to the deep-seated tumour and the dose repeated.

X-rays have proved useful in the following diseases:—

1. OF THE SKIN.—Rodent Ulcer, Pruritus and Hypertrichosis.
2. NEURALGIAS are frequently relieved, the dose depending on the depth of the nerve, from superficial in the case of the trigeminal to deep in sciatica.
3. TUBERCULOUS GLANDS in the neck respond well and a large proportion of cases can be practically cured without operation.

4. LEUKÆMIA is benefited, but not cured.
5. EXOPHTHALMIC GOITRE.—One-third to half a skin unit dose is used, and the goitre begins to shrink in about a month, the general symptoms at the same time improving. The dose may be repeated in 4 to 6 weeks.
6. UTERINE MYOMA give a high percentage of good results, with shrinkage of the growth, diminution or arrest of hæmorrhage and relief of pain. The treatment is given at a single sitting usually without unpleasant effect.
7. MALIGNANT DISEASE.—The types of Cancer cell that can survive the intensive bombardment of massive doses of highly penetrating rays through filters of gradually increasing thickness are becoming less and less. With closer co-operation between the surgeon and the radiologist, fewer cases will be declared as inoperable, but even in the inoperable cases there are few that do not derive some benefit.

The rationale of the treatment is to destroy pathological cells which are all of a low type, while the surrounding normal higher grade cells are not affected. According to the dose and vulnerability the result varies from temporary loss of growth to complete necrosis, the low grade cells of sarcoma with rapid mitosis being more vulnerable than the higher grade cells of carcinoma.

At one stage or another every operable case of malignant disease should be treated with either X-rays or Radium, and cases operated on should be given as early as possible a course of X-rays at gradually increasing interval for a period of two years.

SECTION III

FOOD AND THE PRINCIPLES OF DIETETICS

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THE INFLUENCE OF DIET ON HEALTH

By SIR W. ARBUTHNOT LANE, BART., C.B., M.S., F.R.C.S.

Revised June, 1934

It is hardly necessary in these days for me to produce more than a very limited amount of evidence bearing on this subject, and that evidence is incontrovertible. To commence with, I would point to the experiments made by Dr. Alexis Carrel in the United States in 1911, when, for the first time in history, he succeeded in growing living tissues upon a microscope slide—for which and other research work he was awarded the Nobel prize. I was fortunate in seeing these experiments within a fortnight of their initiation. By means of these experiments, he demonstrated the overwhelming importance of the removal of the products of digestion of these cells at sufficiently frequent intervals, and that any neglect to eliminate the evacuations often enough, resulted in the lowering of the vitality of these cells and, later, in their death. Every cell in the body behaves as the whole body. It obtains its nutriment from the blood, digests it in its interior, and discharges the products of its digestion into the blood-stream for their excretion by the kidneys, etc. The tissues that he fed, and to whose drainage he attended at sufficiently frequent intervals, grew and thrived, and he demonstrated that, with suitable food and efficient drainage, these cells can live indefinitely.

In January of this year I received an invitation to attend the Food Congress at Battle Creek, at which Dr. Carrel showed the foetal chickens' heart, which I saw starting on its cycle of growth in 1911. It is now living and growing actively in 1928—seventeen years after the initiation of the experiment. He was able to exhibit a cinema film, in which were reproduced the details of the process of growth of living tissue upon a slide. This experiment shows, in the clearest manner possible, what a preponderating part drainage plays in the maintenance of the health and vitality of our tissues as compared to diet.

Let us turn now to the experience of Major-General Sir R. McCarrison, I.M.S. Perhaps no other observer has done work approaching in excellence that which he has carried on in dietetics.

The complete freedom—from any of what can safely be called the diseases of civilization, or, for all practical purposes, diet diseases, all of which are consequent on static changes in

the gastro-intestinal canal—of those races who live on good food, and whose habits are regular and efficient, can be clearly demonstrated by quoting Sir Robert McCarrison's own words:—

' For some nine years of my professional life, my duties lay in a remote part of the Himalayas, amongst isolated races far removed from the refinements of civilization. Certain of these races are of magnificent physique, preserving, until late in life, the characters of youth; they are unusually fertile and long-lived and endowed with nervous system of notable stability.

' During the period of my association with these people, I never saw a case of atrophic dyspepsia, of gastric or duodenal ulcer, of appendicitis, of mucous colitis, or of cancer, although my operating list averaged over 400 operations a year. While I cannot aver that all these maladies were quite unknown, I have the strongest reason for the assertion that they were remarkably infrequent. The occasions on which my attention was directed to the abdominal viscera of these people were of the rarest. I can, as I write, recall most of them—occasions when my assistance was called for in the relief of strangulated hernias, or to expel the ubiquitous parasite, *ascaris lumbricoides*. Amongst these people, the abdomen over-sensitive to nerve impressions, to fatigue, anxiety, or cold, was unknown. Their consciousness of this part of their anatomy was, as a rule, related solely to the sensation of hunger.'

In a later letter he wrote to me, was the following passage:—

' For myself, I work on more and more amazed, day by day, by the extraordinary effects of faulty food on the animal organism. I begin to think that faulty nutrition is the bed-rock cause of the vast majority of tissue ailments.'

Another illustration of the fact that people living on a perfect diet, and having normal habits of life, are free from the diseases which affect civilized communities, is afforded by the following quotation from a book written by Dr. Ernest H. Tipper, entitled '*The Cradle of the World and Cancer*', in which he describes his experience of twenty years spent among the primitive race which inhabits Benin, West Africa, a race quite distinct in type from those among whom Major-General McCarrison lived. He states:—

' The average daily number of cases seen, during my twenty years' service in West Africa, was about sixty, ex-

clusive of official rating; yet I only saw six cases of cancer altogether; five of them were in coast stations, the other one away in the grass country, but not one case amongst those two million people in the heart of the Niger Delta; and I only once came across a case of appendicitis when in charge of a coast station, and that was not a clear case.'

Can anything be more impressive and striking than those statements made by men of great experience? These testimonies can be supported by those of many other very skilled medical men, but it is quite unnecessary to quote them here.

The physique of those native races referred to here by Major-General Sir Robert McCarrison and Dr. Tipper far excels that existing in communities living in a state of civilization. All over the world, the influence of the diet and habits of the white man is causing the deterioration of these robust races, wherever contact is effected between them, and the process of degeneration goes on till finally the physique of the native and his liability to diseases becomes identical with that of the people amongst whom his lot is cast. Observe, for instance, the steady degeneration of the Negro, and his incidence to the diseases of civilization as he ascends through the Southern States of America, till he reaches Chicago, when the relation of cancer and all the other evidences and consequences of civilization are identical in the Negro with those of the white inhabitants of that town.

That the health and vitality and freedom from disease of a highly civilized community can be improved very materially in a short period of time, by the use of a diet which approaches in its composition that eaten by native races who are free from our diseases, is demonstrated by the result of the measures adopted by the famous physiologist, Dr. Hindhede, when, during the Great War, an entire nation, that of Denmark, was faced with the probability of a terrible famine, with the consequences which would, in the ordinary course, inevitably result from it. Dr. Hindhede added to the diet of the people all the food and roughage, which would otherwise have been fed to the vast number of cattle which he caused to be killed. He kept alive only such animals as the cows and fowls, to provide food for the children. One would naturally expect that much gastric irritation would have resulted from the ingestion of such a quantity of material as would be considered by many to be most indigestible and, consequently, irritating to the mucous membrane of the gastro-intestinal tract; but, on the contrary, the mortality was reduced to a point never previously reached, while the vigour and vitality of the people was so increased that the terribly fatal epidemic of influenza, which swept through Europe, left practically no mark upon the Danes.

This experience should do much to destroy the belief that such 'roughage' as is contained in whole wheat flour, can exert any other than a beneficial effect on digestion.

Numbers of other experiments on a less gigantic scale can be adduced, to confirm the fact that roughage, as part of diet, is not only beneficial, but, indeed, absolutely essential to perfect health.

As further evidence of the influence of a natural food, such as milk, in increasing weight and height and the resisting capacity to disease, is well indicated by the experiments made by Dr. Corry Mann upon the boys in the Barnardo Homes, England. He found that the addition of one pint of milk a day to a diet which by itself satisfied the appetite of growing boys fed upon it, could convert an average annual gain of weight of 8.85 lb. per boy into one of 13.98 lb., and an annual average increase of height from 1.84 inches to 2.63 inches. This remarkable betterment was proved by trial to be due, not to the relatively small increase in the fuel value of the dietary, nor to the extra protein supplied in the milk, but rather to more specific qualities of milk in food. Besides increasing the weight and height of the boys, it improved their resisting power to such infections as occurred frequently among boys on the basic diet. All this improvement was maintained over a period of one, two and three years.

I have now shown (1) that we have, on the one hand, vigorous races living under natural conditions quite free from all the diseases of civilization; (2) that the adoption of the diet and habits of civilization by these people results in the acquisition of our diseases, proportionately to the duration of their exposure to our diet and habits, till, when these become equal, the incidence of disease becomes equal; (3) that the incidence of disease and death may be reduced by approximating the habits and diet of the members of a highly civilized nation to those of the native; and, lastly, (4) that, by the addition, to the diet of growing youths, of a quantity of milk, the vigour, height and weight, health and resisting power to disease is increased in a most striking manner.

It is necessary to speak with complete frankness concerning the manner in which self-poisoning takes place in the civilized individual, laying the foundations of ill-health and disease.

The explanation of the freedom of the native from our diseases, while living in normal conditions, is that his gastrointestinal tract acts as efficiently as the drainage scheme of the home. When the pan of the closet is emptied, the material contained in it passes down through the syphon trap, through

the drain, into the cesspool in the area, and from it there is evacuated into the drain in the street a quantity of the contents of the cesspool, corresponding in quantity to that which passed from the pan into the syphon trap. Because of the nutritive and stimulating qualities of the mother's milk of the food consumed by the native child, material passes rapidly through the large bowel, and is passed automatically, at an interval after each feed, in a porridge-like consistence.

The milk of the civilized mother is usually deficient in such components as are present in that of the more vigorous native, so that the child does not evacuate its bowel with anything like the same certainty and regularity as does the child of the robust native woman.

Again, early in the life of the civilized child, the mother 'regulates its bowel'. In other words, she regards one action a day as sufficient, and teaches the child to control any desire to evacuate the contents of the large bowel, except on a single occasion. What she does is that she endeavours to force the end of the colon, which has been developed for ages to hold only a quantity corresponding to the input, to be occupied by the products of twenty-four hours' nutrition.

This would naturally result in an elongation and distension of this section of the colon to accommodate all this accumulation, but in accordance with a law which I formulated many years ago, namely, 'that we have a simple mechanical relationship to our surroundings, and that any alteration in this relationship is followed of necessity by a corresponding alteration in our anatomy'. Bands and membranes form, which fix this segment of the bowel, its elongation and distension, and cause the balance of the twenty-four hours' faecal matter to be accommodated in that part of the colon proximal to the area of fixation. These bands later contract and control the effluent through the fixed section of the bowel, and, in accordance with the corollary of my law, namely, 'that anything that nature does to enable the individual to meet the altered mechanical relationship, tends to shorten life'. Mechanical changes ensue in the whole gastro-intestinal tract, followed by an invasion of the contents of the small intestine by organisms which ascend from the faecal matter which has accumulated, and causes abnormal putrefactive changes in the colon.

In other words, over and above such mechanical results as elongation and prolapse of the large bowel, the formation of additional bands to support it, the kinking at the duodeno-jejunal junction with the control of the effluent of the duodenum or syphon trap of the system, the over-distension of the duodenum, with ulceration of its mucous lining, the spasm

of the pylorus and the distension of the stomach by material which accumulates in it, the strain upon the upper curve of the stomach is followed by the congestion, and later the ulceration, of its mucous membrane, and this ulceration, like that about the anchored colon, being chronic, tends to become infected by the organisms of cancer.

The material which accumulates in the large bowel, decomposing beyond what is normal, infects the mucous membrane of the colon and appendix. Organisms extend into the dammed up and stagnating contents of the small bowel, infecting the food supply in proportion as they invade it, and with their virulence.

The absorption of these toxins and organisms by the blood vessels and lymphatics, being in excess of what the liver, kidneys and ductless organs can deal with, circulate through the entire body, lowering the vitality of every cell and causing their degeneration. In consequence, the whole gamut of diseases, as known to us in civilization, appears in sequence with the age of the individual, none of which troubles exist in the native when the drainage scheme acts normally.

Surely, it is not incorrect to call these conditions, which are consequent on our diet and habits, filth diseases. To deal with them efficiently, we must devise means by which their causation can be controlled and eliminated.

This can only be done by instructing the people in the laws of health, and in rendering accessible to them just such foods as are essential to health.

In this connection I would refer to a paper I read before the Physical Society of Guy's Hospital entitled 'Why Constipation Kills' (*New Health*, January, 1932), and to my book 'The Prevention of the Diseases of Civilization' which illustrates the changes referred to.

THE COMPOSITION OF THE PRINCIPAL ARTICLES OF FOOD AND CALORIC VALUE

DAL

Contains a high percentage of protein, and is very largely eaten, by both rice and chapati-eaters, to compensate for the low percentage of protein in both these articles of diet. Dal is not easily digested unless well boiled; while boiling, it should be constantly stirred, and the boiling should continue, until no trace of the grain is left. There are several varieties of dal. Moong dal is more suitable for invalids than Arhar dal.

Khesari dal has been said, without any good evidence, to cause gout. Masoor (red) dal contains a higher percentage of protein, and Urad dal, in Bengal, is considered more suitable for the hot weather.

The Chemical Composition of the Different Kinds of Dal

Variety of Dal			Protein per cent.	Carbohydrate per cent.	Fat per cent.
Mung	...	...	23.62	53.45	2.09
Massur	...	...	25.47	55.03	3.00
Gram	...	...	19.91	54.22	4.94
Kaloi	...	...	22.58	58.02	1.10
Matter	...	...	22.01	53.97	1.06
Arhar	...	...	21.70	54.06	2.50
Urad	..	...	22.33	55.22	1.95

McCay.

MILLETS

The chief are:—

- | | |
|------------|------------------------|
| (1) Jawar. | (4) Maduwa. |
| (2) Bijra. | (5) Baijar (Mixture of |
| (3) Makka. | Jau and Chana). |

This is the staple food of the poorer classes. It is ground into atta and cooked as chapaties.

RICE

It is the staple food of the great majority of the people of India; the inhabitants of Bengal, Assam, Behar and Orissa, and Madras eat rice in some form or other. It is in fact the staff of life of about half the human race.

Rice is the grain of *Oryza Sativa*, and there are more than a hundred varieties. As a food, it is poor in protein and fat, but rich in carbohydrates and minerals; its poverty in nitrogen makes it a badly-balanced food, when consumed alone, the starch being out of proportion to the other principles. The carbohydrates consist chiefly of starch, the sugar and dextrin only amounting to about 1.25 per cent., about 0.4 per cent. being sugar. When cooked alone, it is best steamed; for, if boiled, a portion of the already small quantity of protein and saline matter is lost. It is a valuable and nutritious food, easy of digestion and of great value in illness; new rice should, however, not be used, but the oldest obtainable, as this is better and more easily digested. In the United Provinces, the best rice is that grown in the lower Nepal hills, and obtainable in the markets of Dehra Dun and Tanakpur.

A diet deficient in Vitamin B, e.g. polished rice, is the chief factor in the production of Beri-beri.

Composition of Rice Nutrients (Per Cent.)

Different Kinds of Rice	Water	Protein	Fat	Starch-Sugar and Gum	Cellulose	Ash
Rice, hulled	12.58	6.73	1.88	72.70	1.53	.82
Rice, polished	12.52	7.52	.84	74.66	.48	.64
Rice in husk	10.50	6.80	1.60	68.10	9.00	4.00
Burma Rice	11.13	6.95	.90	77.25	...	1.84
Country Rice	11.05	6.62	.50	81.07	...	1.01
Patna Rice	9.80	7.22	.09	81.81	.18	.90

Caloric value of uncooked rice is 1,080 and of boiled rice 525.

WHEAT

Flour made into chapaties is the staple article of food in those Provinces in which rice is not used.

Composition of Indian Wheat (Per Cent.)

Protein	Carbohydrate	Fat	Cellulose	Salts
10.99	70.10	2.08	1.92	1.46

Caloric value of wheat flour is 1,625.

ANIMAL FOOD

FISH.—As in meat, protein and fat are the chief nutritive constituents. There is a popular belief that fish is an aphrodisiac, and is especially valuable as brain food: it does not possess either of these qualities.

Fish is extensively eaten, especially in Bengal and along the Bombay and Gujarat coast. 'Bombay duck', 'Bomba' or 'Bombil' is cured by drying and salting, and is usually eaten with rice.

The following are the commoner varieties in Bengal and the adjoining Provinces:—

Rohi, Katla, Tengra, Hilsa, Parshi, Bata, Mouroola, Bhetki, Koi and Magoor.

Fish is a frequent cause of urticaria, and by Indian physicians is not given in skin diseases.

General average composition is:—

Protein per cent.	Fat per cent.	Carbohydrates per cent.	Calories per lb.
10.9	2.4	...	205

MEAT.—The chemical composition of meat varies greatly, depending on the breed of the animal, the degree and way in which it has been fattened and the joint examined. Three-quarters of the total weight of meat is made up of water: the younger the animals, the higher the percentage of water, and, therefore, the lower the nutriment. When an animal is fattened, fat is deposited in muscles and replaces water, not protein; the increase in nutritive value is, therefore, absolute. The chief mineral substances are Phosphoric Acid and Potash. The extractives, so called, are important, because they can be extracted from meat by means of boiling water; they have no direct nutritive value, but are excellent stimulants and give the characteristic taste to the different kinds of meat. The chief result of cooking meat is to diminish the amount of water it contains, and this results even when meat is boiled; hence the increased nutritive value of cooked as compared with raw meat, a result that is the reverse of that which follows the cooking of vegetables.

Mutton and goat's meat are principally used; the former is more digestible, but Indian meat generally is of very poor quality as compared with European meat. It is general belief that soup made from wild pigeons is beneficial in hemiplegia and diseases of the motor nervous system.

Composition of Animal Food

		Water	Protein	Fat	Carbohydrate	Salts	Calories per lb.
Beef	...	74.4	20.5	9.5	—	1.6	1,190
Mutton	...	62.8	18.5	18.0	—	1.0	1,105
Mutton (Goat)	...	72.0	21.0	2.5	—	1.2	950
Bacon	...	30.0	9.8	48.0	—	2.8	3,030
Venison	...	75.9	10.9	1.9	—	1.1	820
Fowl	...	73.2	22.5	3.2	—	1.0	805
Fowl's egg	...	73.5	13.5	11.6	—	1.0	720
Fish	...	82.6	16.5	0.4	—	1.2	325

Composition of the Various Milks

	Source		Water	Casein	Albumin	Fat	Milk Sugar	Ash
Woman	87.41	1.03	1.26	3.78	6.21	.31
Cow	87.17	3.02	.53	3.60	4.88	.71
Indian Buffalo	82.16	4.26	.46	7.51	4.77	.81
Goat	85.71	3.20	1.09	4.78	4.46	.76
Ass	89.61	.67	1.55	1.61	5.09	.51
Camel	86.57	4.00		3.07	5.59	.77

Buffalo's milk has a very high percentage of fat—more than twice that of human or cow's milk; also, a higher percentage of casein than cow's milk.

Goat's milk has approximately the same amount of casein and sugar as cow's milk, but a higher percentage of fat.

Donkey's and camel's milk is considered by Indian physicians to benefit cases of tubercle of the lungs.

CREAM.—Composition is usually stated to be:—

Water	...	74.0 per cent.
Casein and Albumin	...	2.5 per cent.
Fat	...	18.5 per cent. (varies from 15 to 55)
Milk Sugar	...	4.5 per cent.
Ash	...	0.5 per cent.

Calories per lb.: Thick Cream 2,912; Thin Cream 908.

MILK

COW'S MILK.—Pure cow's milk has a faint odour and sweetish taste, Sp. Gr. 1.028 to 1.035. It freezes at 0.56°C. and boils at 100.9°C.—the reaction varies. It is an important food to all classes of people; not only on account of its superior nutritive characters and easiness of digestion, by children and

invalids, but also on account of its adaptability, for combination with many other articles of diet. One pint yields 400 to 450 calories.

Indian milk is terribly polluted and adulterated, and it is a matter of great importance that a standard of purity should be set up by Government, and the sale carefully watched on behalf of the consumer.

SKIMMED MILK—Is that which remains after the removal of the cream by hand or machine; it contains the proteins and carbohydrates—but only one per cent. of fat in hand-treated and 0.1 to 0.3 per cent. of cream in machine-skimmed milk.

CONDENSED MILK.—Consists of whole or skim-milk evaporated to one-third its bulk, either unsweetened, or sweetened with cane sugar.

One disadvantage of the unsweetened milks is that they are apt to go bad when the tin is opened.

Condensed Milks all come under one of three classes:—

1. Condensed whole milk, unsweetened; example, Ideal, Viking.
2. Condensed whole milk, sweetened; example, Nestle, Milkmaid.
3. Condensed skimmed milk, sweetened; there are a great number of this,

The chief defect of condensed milks, from a nutritive point of view, is that they contain too little fat. Class 1 is alone satisfactory in this respect. Class 3 is entirely unsuited for a baby's food for this reason, and also because it contains too little protein.

It must, however, be admitted that condensed milk is more easily digested than fresh cow's milk.

POWDERED MILK.—Is milk reduced to a powder by evaporation; it keeps well, and is convenient for transport.

CASEIN PREPARATIONS.—In addition to commercial casein, there are several preparations on the market, such as Sanatogen, Plasmon, etc.

Casein preparations and milk powder can be added to fresh milk, milk puddings and cocoa, in order to increase the amount of nutriment.

LACTALBUMIN.—Is prepared in a commercial form, and is available for use in the feeding of infants. Cow's milk contains much less albumin than human milk, and the albumin is coagulated by boiling the milk; the child is, therefore, robbed of one of its important elements. If cow's milk is diluted to 1 in 3, the casein is equivalent to that in human milk, but the Lactalbumin is reduced to 1/9 that in human milk. This deficiency may be remedied by the addition of commercial Lactalbumin to the warmed mixture. One of the most popular preparations of Lactalbumin is ALBULACTIN.

' **KOUMTISS** ' is fermented mare's or ass's milk, largely used by the Tartars.

' **KEPHIR** ' is fermented cow's or goat's milk.

' **YAOURTE** ' is the Turkish name for fermented cow's milk, commonly eaten all over the Levant.

' **MAWA** ' or ' **KILOYA** ' is milk desiccated by prolonged heating in iron pans. It is largely used for making Indian sweets.

' **RABRI** ' or ' **BASUNDI** ' is another form of thickened milk.

PEPTONIZED MILK, PREPARATION OF.—See Sick Room Recipes.

WHEY, PREPARATION OF.—See Sick Room Recipes.

Caloric value of Milk varies from Skimmed Milk 170, Whole Milk 325 to Condensed sweetened 1,520.

GHEE

A liquid clarified butter. Butter is heated until all the water is driven off, which is known by the cessation of crackling and giving off of steam. It is then strained through muslin, to remove curd, etc., treated with common salt, and sometimes betel-leaf, bottled and corked down; so preserved, it will keep indefinitely. It is made from cow's or a combination of cow's and buffalo's butter.

Composition and Caloric Value

Water	Protein	Fat	Carbohydrate	Ash	Calories per lb.
11.0	1.0	85.0	—	30.	3,500

FRUIT

The digestibility of fruit depends on the nature of the fruit and its degree of ripeness; cooking makes fruit more digestible, by softening the cellulose. Dried fruits—the raisin, date and fig—are valuable foods, with a high nutritive value. Nuts are among the most nutritive of all foods.

Composition of Fruits (Average Percentages)

Kind of Fruit	Refuse	Water	Protein	Fat or Ether Extract	Carbo- hydrate. Nitro- gen free Extract	Crude Fibre	Ash	Calories per pound
Apples ...	25.0	84.6	.4	.5	13.0	1.2	.3	290
Apricots ...	6.0	85.0	1.1	...	13.5	...	.5	270
Bananas ...	35.0	75.3	1.3	.6	21.0	1.0	.8	460
Figs ...	...	79.1	1.5	...	18.8	...	.6	380
Grapes ...	25.0	77.4	1.3	1.6	14.9	4.3	.5	450
Guavas ...	...	82.9	1.3	.7	8.0	6.6	.5	315
Lemons ...	30.0	89.3	1.0	.7	7.4	1.1	.5	205
Loquats ...	...	77.9	.2	...	20.2	.6	1.1	395
Mangoes ...	40.0	87.4	.6	.1	9.9	1.2	.5	220
Musk Melons	50.0	89.5	.6	..	7.2	2.1	.6	185
Oranges ...	27.0	86.9	.8	.2	11.6	...	.5	240
Peaches ...	18.0	89.4	.7	.1	5.8	3.6	.4	190
Pears ...	10.0	80.9	1.0	.5	15.7	1.5	.4	163
Pineapples ...	40.0	89.3	.1	.3	9.3	.4	.3	200
Pomegranates	30.0	76.8	1.5	1.6	16.8	2.7	.6	460
Water Melons	59.4	92.1	.4	.2	...	6.7	.3	140

It will be noted that the only nutritive element of importance in fruit is the Carbohydrate group, and, as a general rule, half to three-quarters of these Carbohydrates is sugar (lævulose). The mineral constituents are important, consisting mainly of Potash in combination with various vegetable acids.

VEGETABLES

While the characteristics of animal food is richness in protein and fat, that of vegetable foods is the abundance of carbohydrates, sugar and starch. Vegetable foods are less digestible in the stomach, and are less completely absorbed than animal foods, partly by reason of the indigestible covering of cellulose that covers the nutritive constituents in the cells, and partly on account of the bulk. The effect of cooking green vegetables is that they lose part of their protein and carbohydrates and much of their mineral matter, and gain water.

*The Composition of Some of the More Common Vegetables,
Uncooked (Percentages)*

Vegetables	Water	Protein	Fat	Carbo- hydrate	Fibre	Ash	Calories per lb.
Cabbage	88.53	2.31	.67	5.12	1.71	1.66	115
Cauliflower	90.95	2.05	.45	4.80	1.90	.75	110
Cucumber	91.91	.73	.21	3.10	.60	.51	80
Pumpkin	93.10	1.00	.15	5.20	1.10	.60	95
Spinach	90.26	3.15	.54	3.31	.77	1.91	110
Vegetable Marrow	91.90	1.00	.10	5.20	.70	.50	120

CALORIC VALUE OF FOODS

The term 'Calorie' means the amount of heat that is required to raise 1 pound of water 4° F. The Calorie is a standard which is as applicable in estimating the energy value of foods as the gramme or pound is in calculating weight.

The method of applying the Calorie standard to a food is very simple: in the case of Protein and Carbohydrates, the percentage contained in the food is multiplied by 4.1, and in the case of fat, by 9.8; the result is the total Calories yielded by 100 grammes of the food. (1 lb. = 453.592 grammes.)

General Table for Food Values of Food as purchased

Food	Protein per cent.	Fat per cent.	Carbohy- drates per cent.	Calories per lb.
Barley (Pearl)	7.4	1.2	76.7	1,015
Beans	23.1	2.3	58.0	1,520
Biscuit (average)	8.8	.0	.75	1,035
Bread (average)	9.2	1.3	53.1	1,215
Butter	1.0	.83	...	8,510
Cheese	25.2	33.7	2.1	1,950
Chicken	16.3	10.2	...	780
Corn flour	...	..	.90	1,070
Cream, thin	2.5	18.5	4.5	908
Cream, thick	1.4	67.6	2.2	2,912
Dried fruit (currants, raisins average).	1.8	8.8	69.3	1,480
Eggs (weight 2 oz. in shell).	11.9	9.3	...	613
Fish (general average)	10.9	2.1	...	295
Flour (average)	11.1	.1	74.8	1,650
Fruit (average)	.4	.5	.8	180
Green vegetables	1.4	.2	4.8	145
Lentils	24.8	1.8	54.8	1,552
Milk, 20 oz. to pint	3.3	.1	.5	322

Food		Protein per cent.	Fat per cent.	Carbohy- drates per cent.	Calories per lb.
Milk, skim ...	...	3.1	0.9	5.1	170
Milk condensed	...	.9	13.5	51.5	1,693
Mutton (average)	...	13.8	17.1	...	977
Nuts in shells	...	.16	.60	.12	3,040
Pears ...	...	22.0	1.7	53.2	1,461
Potatoes ...	...	1.8	0.1	14.7	310
Rice ...	...	7.4	.4	79.2	1,620
Sugar, white ...	...	...	...	100	1,790
Sugar, brown	..	.	...	.95	1,700

VITAMINS

Vitamins are substances present in various foods, and essential for the maintenance of health and growth. They have intense physiological activity, exerting their effects on laboratory animals in doses which are measured in thousands of a milligram. Much progress has recently been made to establish their chemical identification.

They are easily oxidized and are liable to destruction by food preservatives, but it is at present uncertain as to how far the ordinary process of cooking affects vitamins, but it is probable that Vitamin A is not appreciably affected by the pasteurization of milk.

VITAMIN A.—Is fat soluble. Growth promoting. It occurs abundantly in the liver of certain fish especially cod and halibut, cream, butter and green vegetables. It is very closely related to the plant pigment Carotene. Deprivation stops the growth of an animal and leads to disease of the eyelids, which may spread to the eyes (Xerophthalmia).

It has been called the anti-infective vitamin, and is probably important in enabling the body to resist disease at any age. Puorperal septicæmia was cured by giving concentrates of Vitamin A and D in cases giving a positive blood culture; it is rare for recovery to take place under other treatment, when organisms can be grown from the patient's blood. It has also been used with benefit in the treatment of nervous diseases. The biological method of estimating Vitamin A depends upon observation of growth in a group of rats.

VITAMIN B.—Water soluble. It has been subdivided, but the original B, the anti-neuratic vitamin, has been obtained in crystalline form. The pellagra-preventing vitamin is probably identical with B₃. B₁ like B₂, has been shown in the laboratory to be essential to the health of rats, as B₃ and B₅ is to that of pigeons. It is not as yet possible to say whether these different substances will be isolated and defined, and their relation to one another, all of them are present in yeast; other articles of diet containing Vitamin B are nuts, seeds, lettuce and celery. Absence of Vitamin B produces first intestinal atony and finally Beri-beri.

VITAMIN C.—Water soluble. Is the least stable of all the vitamins, although not completely destroyed by cooking. Occurs chiefly in orange, lemon, cabbage and tomato. Orange juice can be concentrated to six times the potency of the original juice, but rapidly loses its activity when mixed with other substances such as cod liver oil or malt extract. It has recently been discovered that if dried peas are moistened and allowed

to germinate that Vitamin C was produced during the first stages of growth. Deprivation leads to changes in the teeth and scurvy.

VITAMIN D.—Fat soluble. Was discovered as the result of a search for the cause of rickets. This antirachitic vitamin occurs in cod liver oil, cream, green vegetables, egg-yolk and butter. Ultra-violet light and sunlight can cure rickets, and at first it was difficult to understand how these two therapeutic agencies could have the same effect as cod liver oil. This antirachitic property can be given to many foods, other substances and ergosterol, when subjected to ultra-violet rays.

Deprivation of Vitamin D not only leads to rickets, but also to defective dentition and caries.

* **VITAMIN E.**—Fat soluble. Antisterility. Occurs principally in wheat germ, lettuce leaves, seeds and green leaves. There is no evidence that the shortage of Vitamin E is of importance in human nutrition. The sterility, noted in rats on deprivation, was of gradual onset after two or three generations. See also the article—Recent Advances in Medicine.

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VITAMIN CONTENT OF FOODS

	A	B	C	D
1. Almond	+	++?	X	
2. Apple	+	++	++	
3. Banana	?	+	+	
4. Beet root	—	+	+	
5. Brains	+	++	?	+
6. Bread made with milk	+	+	—	+
7. Bread made with water	—	+	—	
8. Butter	++	++	—	
9. Butter milk	+	++	+V	
10. Cabbage, cooked for a short time	++	++	+	
11. Carolina beans	+	+++	X	

					A	B	C	D
12.	Carrots, cooked	...	...		++	+	+V	
13.	Carrots, raw	...	...		++	+	+
14.	Cauliflower	...	...		+	++	?
15.	Cheese	...	...		++	++	-
16.	Cocoanuts	...	...		+	++	-	+
17.	Cod-Liver Oil B.I.	...	...		+++	-	-	+++
18.	Cream	...	...		+++	++	+V	
19.	Dried milk (whole)	...	...		+++	++	+V	
20.	Eggs	...	...		+++	+	-	+
21.	Fish (fat)	...	...		+	+	?
22.	Fish (oil)	...	...		+	++	?	+
23.	Grape-fruit	...	...		?	++	++
24.	Grape-juice	...	...		?	+	+
25.	Green beans	...	...		++	++	X	
26.	Heart	...	...		+	+	+	+
27.	Kidneys	...	...		++	++	+	+
28.	Lemon-juice	...	...		-	++	+++
29.	Lettuce	...	...		++	++	+++	+
30.	Liver	...	...		++	++	?
31.	Maize	...	...		+	++	-
32.	Milk condensed	...	...		+++	++	+V	+
33.	Milk evaporated	...	...		+++	++	?
34.	Milk fresh (not pasteurized)	...	...		+++	++	+V	++
35.	Navy beans (white beans)	...	...		+	+++	X	
36.	Oats	...	...		+	++	-
37.	Onions	...	...		?	++	++
38.	Orange-juice	...	...		+	++	+++
39.	Parsnip	...	...		-	++	?
40.	Pea-nut	...	...		+	++	X	
41.	Peaches (raw or tinned)	...	...		++	+	++
42.	Peas, fresh	...	...		++	++	+++	+
43.	Pickled cabbage	...	...		X	X	++	
44.	Pineapple (raw or tinned)	...	...		++	++	+++
45.	Potatoes (cooked)	...	...		+	++	++
46.	Pumpkin	...	...		++	?	?
47.	Raspberries (raw or tinned)	...	...		X	X	+++	
48.	Raw cabbage	...	...		++	+++	+++
49.	Rye (ground)	...	...		+	++	?
50.	Skimmed milk	...	...		+	+	+V	
51.	Spinach, fresh	...	...		+++	+++	+++
52.	Spinach in tins	...	...		+++	+	+++
53.	Swedish turnip	...	...		-	++	+++
54.	Sweet potatoes (white potatoes)	...	...		++	+	?
55.	Tomato, raw or preserved	...	...		++	+++	+++
56.	Turnip rooted cabbage	...	...		-	++	+++
57.	Usual walnut	...	...		X	++	X	
58.	Walnut, white, American	...	...		X	++	X	
59.	Wheaten bread made with milk	...	...		++	++	?	+
60.	Wheaten bread made with water	...	...		+	++	-
61.	Wheat bran	...	...		++	+++	-
62.	Wheat grain	...	...		++	+++	-	+
63.	Whole barley	...	...		+	++	-

NOTE.—Contains Vitamins ... + Presence of Vitamin Doubtful ?
 Vitamin Content High ++ Vitamin Content Unknown ... X
 Vitamin Content Very High +++ Vitamin Content Variable ... V

ARTICLES OF INDIAN DIET AND METHODS OF THEIR PREPARATION

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PREPARATIONS FROM RICE

Rice can be prepared in the following ways:—

- | | |
|---------------------|-------------------------|
| (1) Chawal or Bhat. | (5) Curd or Dahi Kheer. |
| (2) Khichri. | (6) Pulaw. |
| (3) Milk Kheer. | (7) Zarda. |
| (4) Feerni. | |

Moorhi is baked rice, Choora is wet rice beaten flat and dried, and Chal Bhaja is parched rice. Kanji is the water in which rice has been boiled.

(1) CHAWAL OR BHAT.—It is plain boiled rice, with the water drained off. This is the very common article of diet in India. Mixture of Bhat and milk, or Bhat and Dal Moong, is advised in all the diseases where light food is necessary.

(2) KHICHRI.—This is rice mixed with dal of various kinds, and is prepared in two different ways:—

(a) KHICHRI MOONG.—Take equal quantities of rice and moong dal, wash in water, place in a vessel with sufficient water to cook the rice well, and salt, saffron, pepper, and big ground cardamoms to flavour. When the water has evaporated, and the khichri is cooked, add the required amount of ghee, and keep it on a slow fire for about half an hour. This khichri is a light food and is advised after purgatives, and in all the diseases where light and nutritive food is necessary.

(b) KHICHRI URAD (any other kind of dal can be used, but urad has the best taste).—Take rice and urad dal equal parts, wash in water, in a vessel place ghee with browned sliced onion, ground saffron, pepper, green coriander leaves and big cardamoms; to this add the rice and dal and, finally, salt. Then cook. This khichri being difficult to digest, is not considered suitable for patients.

(3) CURD OR DAHI KHEER.—There are two ways of preparing this:—

(a) Mix the raw rice (washed) in dahi, with a little salt and powdered saffron; boil these until the rice is well cooked. It is served in a semi-solid state, and is a very useful diet for diarrhoea and dysentery cases when solid food is being commenced.

(b) Take some ghee in a vessel and fry a little zoora, then add saffron and ground pepper, after this the rice. Fry these for five minutes, then add equal parts of dahi and water, sufficient only to cook the rice; finally flavour with salt. It is served in a semi-solid form. This is not suitable for patients but can be given to convalescent.

(4) FEERNI.—Take two chittaks of powdered rice; mix with one seer of milk. While cooking, stir well, and when partly cooked, add kishmish, in small particles, and four chittacks of sugar. Serve in earthen plates. It is easily digested. Given in diarrhoea, dysentery and convalescent cases.

(5) MILK KHEER.—This is prepared by boiling rice in milk, adding sugar and dried fruit, such as almonds, raisins, etc. This is good for convalescent and can be given in cases in which there is no digestive trouble.

(6) PULAW.—Cut up some meat in large pieces, and make soup; remove the pieces of meat from the soup. To some ghee in a vessel, add browned onion, and fry with pepper, saffron and ground coriander. After this fry the meat, and finally the rice for a few minutes, then add the soup with some salt to flavour. Cook the whole on a slow fire till the soup evaporates, then add more ghee, and put the degchi on a slow fire for about 15 minutes. When serving, cover with browned onion and big cardamoms. It is said to be easily digested, is nourishing and is useful for convalescent cases.

(7) ZARDA.—Place sugar syrup in a degchi, boil rice with little powdered saffron, drain the water away before the rice is quite cooked, fry some cloves, cinnamon, cardamom seeds ground in ghee, then add the rice and syrup, and let this cook on a slow fire; dried fruit, such as almonds, raisins, etc., are also added. It must be kept constantly stirred to prevent burning. It is not easily digested, and is not suitable for invalids.

PREPARATIONS FROM WHEAT

Wheat is generally ground in the following forms:—

(1) Maida (flour) is the finest result.

(2) Atta is next.

(3) Suji is coarser than atta.

(4) Dalia is the coarsest of all.

(1) MAIDA preparation includes Puries, Kachories, Chapaties, Double Roti, Biscuits and Shirmal.

(2) ATTA preparations include Chapaties, Paratas, Puries, Kachories and Nan.

(3) SUJI preparations include Halwa, Chapaties, Paratas, Puries, Kachories, Double Roti, Biscuits and Shirmal.

(4) DALIA.—The dalia is boiled in water, milk is added, and salt or sugar according to the patient's taste. This is very nourishing and useful both for convalescent cases and patients.

CHAPATIES.—This can be made from either atta, suji or maida; the flour is mixed well with water, into a thick paste, rolled out flat and thin to the size of a small plate; it is then cooked by being placed on a hot iron plate ('tawa') for about a minute for each side of the chapati; it is then removed from the 'tawa' and placed on the coals until it swells up. This is a very common article of diet in India. Suji chapaties are easy of digestion and excellent for invalids. Maida chapaties must not be given, being difficult to digest.

PARATAS.—Mix a little ghee and salt with either atta, suji or maida; add sufficient water to make into a paste. Then roll the paste out on a board and fold into four layers, smearing a little ghee between each fold; then roll out to the size of a small plate and fry well in ghee or oil on a 'tawa'. This is a very common article of diet, but it is not easily digested; can be given to the convalescent, but is unsuitable for the sick.

PURIES (or POOREES).—These are small chapaties fried in a pan with ghee or oil. It is a very common article of diet, and, if properly fried, is often more easily digestible than chapati, as the starch granules are entirely broken up by the action of the hot ghee. It is not recommended for the sick but is generally advised for convalescents.

KACHORIES.—In this, two preparations of paste are necessary:—

No. 1 is made of atta, maida or suji, in the same way as for paratas.

No. 2 is urad paste, prepared by soaking urad dal for two hours, then washing and taking off the skin, grinding into a paste, adding a little salt, chillies, saffron and coriander (leaves and seeds). Take a small ball of the atta paste, make a hollow in it and fill with the dal paste, cover the top and roll out on a board to 3 or 4 inches diameter, and fry in a hollow pan in the same

way as Puries. This is a form of diet not suitable for the sick-room.

HALWA.—This is another common article of diet all over India, taken as luxury. It is prepared from suji, rarely atta or maida. The suji is fried in ghee or oil, and sufficient milk added to make it into a thin and thick paste; sugar is added while boiling, and dried fruit after being taken off the fire. It is an excellent article of diet for medical and surgical cases.

SHIRMAL.—This is a preparation of suji or maida, mixed with milk and a little ghee, rolled out to the size of a small plate, and baked in an oven. A little sugar or salt may be added to flavour. Shirmal is a very common article of diet among Mahammadans all over India. It is not a suitable sick or convalescent diet, not being easily digested.

NAN.—This is also largely used by Mahammadans. Atta is mixed with water and salt, rolled out on a board, and baked in an oven. It is not generally recommended for the sick.

DOUBLE ROTI.—It is the Indian name for English bread. It is made by mixing maida (flour) or suji with about 60 per cent. of water, adding salt, yeast or khamir (toddy), and after kneading well is left to ferment, finally being baked in an oven. This is leavened bread as compared with chapaties, which are unleavened bread. It is an excellent article of diet for the sick, being light and easily digested.

BISCUITS.—These are becoming very popular with Indians. They are made of either maida or suji, and butter, mixed into a paste with water, and flavoured with salt or sugar, and baked in an oven. The plain lighter kinds are suitable for invalids.

PREPARATIONS FROM DAL

Preparations are made in two ways for—

- (1) The Sick.
- (2) The convalescent and healthy.

(1) **FOR THE SICK.**—Boil a seer of water, then add 8 oz. of dal mixed with a little ghee, and some ground saffron, pepper and coriander. Allow this to boil for about half an hour, occasionally stirring. If the mixture is becoming too thick, and the dal grain not well cooked, more boiling water must be added. This is continued until no trace of grain is left, then salt added to flavour. If the patient is very ill, only a strained extract is given; in other cases it is well mixed into a paste, and fried with a little ghee, browned onions, and garlic. Moong and

moth are the only two kinds of dal which it is advisable to use in sickness.

The following preparation is very useful in acute cases when solid food is not permitted, and the patient is tired of taking (or cannot take) milk; it is an excellent substitute for mutton or chicken broth among those Hindus who are unable to take meat in any form:—

Take 1 chatak of each of the following dals:—Moong, Moth, Masur and Arhar. Cook as above. This can be given to a patient three or four times daily, and is a very nourishing form of Rasa or Dal-soups.

(2) FOR THE CONVALESCENT AND HEALTHY.—As part of a rice or chapati-eater's diet. Boil any of the following dals, urad, arhar, gram (chana), or masur in the same way as in (1) above; but more condiments should be added, according to taste. When the dal is well cooked, vegetables may be added, such as dahi, tomatoes, dried mangoes, palack, kulfa (these must not be added to dal urad); the whole is then cooked until it is of the desired consistency; then add salt, and boil for five minutes, and remove from the fire. Finally boil some ghee or oil in a cup, with fried onions or garlic, add this to the dal, and cover for a few minutes before eating.

Gram dal is very difficult to digest; it can be ground into atta, in which form it is used in the preparation of sweets and other foods.

There are many other preparations of dal, such as barhi, moongori, papar, dalmoth and chunori. A flour of dal is used in the preparation of jalebi and laddoo.

Pish-pash in Bengal is made by cooking a mixture of rice and dal. This has the advantage that none of the nutritive properties of the rice are lost.

MILLETS

The chief are:—

- | | |
|------------|--|
| (1) Jawar. | (4) Maduwa. |
| (2) Bijra. | (5) Baijar (Mixture of Jau and Chana). |
| (3) Makka. | |

This is the staple food of the poorer classes. It is ground into atta and cooked as chapaties.

SWEETMEATS

These enter largely into the Indian diet. Nearly all are cooked in ghee, which renders them difficult to digest, and are therefore not generally advisable for the sick.

Sweetmeats are divided into two main classes:—

- (1) SWEETMEATS PREPARED FROM KHOWA OR MAWA (*i.e.* milk evaporated down until almost solid), together with sugar, dried fruit, and flavouring essence, such as rose.
- (2) SWEETS PREPARED FROM VARIOUS KINDS OF GRAIN; grain fried in ghee, with sugar or salt and dried fruit.

Sweets prepared from Khowa or Mawa are: (Mawa) Laddoo, Paira, Burfee, Gulabjaman, Singori and Bal, etc.

Sweets prepared from grain-foods are subdivided into two classes:—

- (a) Sweet Preparations.
- (b) Salt Preparations.

(a) SWEET PREPARATIONS.—(Grain) Laddoo (can be made out of moong, suji or besan), Burfee (moong), Amertee (urad), Jalebi (maida), Balusai (maida), Nonkhatai (suji), Halwa (suji), Halwa Sohan (nisasta or pure starch), Gujia (maida or dried fruit).

(b) SALT PREPARATIONS.—Khasta Kachori (without dal stuffing), Kachori (with dal), Dalmoth (dalchana or besan and dalmoth), Mathri (suji or maida), Tirkhoont (maida stuffed with vegetables as potatoes or peas).

The following sweets are those most suitable for the sick: Halwa (suji), Burfee (moong), and Nonkhatai (suji).

The above sweets are, of course, not advisable in diabetes, and in hepatic disease, and intestinal dyspepsia.

The salt preparations should not be given in any form, to cases of general anasarca, ascites, or acute inflammations.

In Bengal, Sandesh, made of cocoanut, and Rasagolla, containing a high percentage of sugar, are the most nutritious and easily digested.

VEGETABLES

Vegetables are generally taken with all meals. They may be divided into three classes:—

(I) Seeds or Fruit; (II) Greens; (III) Roots or Tubers.

I. SEEDS OR FRUITS

- | | |
|----------------------------------|---------------------------------------|
| (1) Beans (Phaleo). | (7) Cucumber (Kakri or Khira). |
| (2) Peas (Mutter). | (8) Torai. |
| (3) Brinjal (Bhata or Baigun). | (9) Vegetable Marrow (Lauki). |
| (4) Ladies' Fingers (Bhindi). | (10) Preserved White Pumpkin (Petha). |
| (5) Pumpkin, red (Kaddoo). | (11) Tomato (Tamatar). |
| (6) Cauliflower (Gobi Ka Phool). | |

Among these, Torai, Lauki and Petha are especially useful for the sick, being easily digested. Petha is also used for preparing various kinds of sweets, such as Petha Grapes, Petha Burfi and Cakes.

METHODS OF COOKING.—Brown onion or garlic in ghee or oil, then add the vegetable, previously washed and chopped up with condiments, and fry well; add water; when well cooked add salt and dahi to flavour. These vegetables are taken either as soup, or dry, i.e. after the evaporation of the water used in the cooking. In cooking greens, if water is not added, there must be sufficient ghee or oil to fry well. For patients, the method of preparing is the same, only condiments should be added, as little as possible, and no dahi.

Note.—Water must not be added in cooking ladies finger or bhindi.

II. GREENS

- | | |
|------------------------|-------------------------------|
| (1) Spinach (Palak). | (4) Dill (Soya). |
| (2) Purslane (Kulfa). | (5) Cabbage (Band Gobi), etc. |
| (3) Fenugreek (Methi). | |

All greens are prepared in the following way:—

First heat sufficient ghee or oil, then add the greens previously chopped up and washed, cover and cook on a slow fire, giving an occasional stir to prevent burning; add salt when the water has evaporated; then the vegetables must be well fried (when the greens are not used for the sick, oil is better than ghee for frying); for the sick, greens should first be well boiled in water, then fried in ghee, as described above. Dill, Purslane and Spinach are the best for sick diets.

III. THE ROOTS OR TUBERS

- | | |
|---------------------|----------------------|
| (1) Carrot (Gajar). | (4) Turnip (Salgam). |
| (2) Potato (Alu). | (5) Onion (Pyaz). |
| (3) Radish (Mooli). | (6) Garlic (Lasson). |

Carrot halwa is a tasty dish, and is used as a tonic. Radish, raw or cooked, is considered useful in piles, and cases of jaundice. Onion is the most useful of the vegetable roots; it is considered to be aphrodisiac, and is recommended in cholera and sunstroke.

Garlic has a great reputation in tuberculosis, and is used in many forms, both externally and internally. In the latter it is given with condiments or fried as described above. Externally it is used in the form of poultices, etc., for tubercular disease of the glands and bones, and for tubercular sinuses.

Method of cooking these vegetables is the same as for No. I. Condiments, such as chillies, are best avoided in a sick diet or given only in small quantities.

VEGETABLE SOUP

- | | |
|--------------------------|------------------------------------|
| 2 cups potatoes (diced). | 6 fresh tomatoes (medium size). |
| 2 cups carrots (diced). | |
| 2 cups green peas. | 1 cup celery with leaves, chopped. |
| | 2 large red onions. |

A few soya, methi and fresh sage leaves, if you have them.

Wash all vegetables well. Do not peel potatoes or carrots. Pour boiling water over the tomatoes and slip off the skins. Put all vegetables on to cook in sufficient cold water to cover well, adding the tomatoes when vegetables are tender. Cook for two hours adding more water if necessary. Serve with pieces of vegetables or strain and add Salt to taste. Serve hot.

FRUIT

The following are the kinds in common use:—

- | | |
|------------------------|---------------------------------------|
| (1) Apple (Sew). | (10) Musk-melon (Kharbooja or Phoot). |
| (2) Apricot (Khubani). | (11) Orange (Narangi). |
| (3) Banana (Kela). | (12) Peach (Aroo). |
| (4) Figs (Anjir). | (13) Pear (Nashpati). |
| (5) Grape (Angoor). | (14) Pineapple (Annanas). |
| (6) Guava (Amrud). | (15) Pomegranate (Anar). |
| (7) Lemon (Niboo). | (16) Water-melon (Tarbooj). |
| (8) Loquat (Loquet). | (17) Bael (Bale). |
| (9) Mango (Amm). | (18) Cocoa-nut (Gola). |

The following are the opinions of Indian Physicians on the uses and action of fruits:—

APPLES.—Useful for functional disorders of the heart, and as a tonic.

FIGS AND GRAPES.—Good laxatives.

DRY GRAPES OR MUNNAKHA.—Nutritious and laxative; for this action raisin tea is often prescribed.

GRAPE LINCTUS OR MUNNAKHA CHUTNI.—Useful for patients who are tired of taking milk. It is prepared as follows:—

Take—

Munnakhas	..	'	...	5 parts.
Coriander or Mint Leaves	..		...	q.s.
Pepper	..	..	...	q.s.
Salt	...	..	...	q.s.

Mix well by grinding.

GRAPES, ORANGE, AND POMEGRANATES.—Useful to remove the taste of medicines, and to allay thirst in fevers.

POMEGRANATE JUICE.—An astringent and is considered beneficial for diarrhoea, but injurious in cases of cough and cold.

LEMONS —Very useful in the treatment and prevention of Sourvy; also, in malarial fever, and to remove the taste after taking medicine.

RIPE MANGOES.—Laxative and tonic. The juice of raw roasted mangoes with a little salt, pepper and zeera (cummin seed) is considered useful in the treatment and prevention of sunstroke.

RIPE BAELE FRUIT.—Used for diarrhoea and dysentery.

JACK FRUIT.—The seed is an excellent food, containing about 18 per cent. of proteins.

TAMARIND.—Soaked for a couple of hours, and the resulting liquid taken with a little sugar, is a refreshing drink in the hot weather.

PLANTAINS.—Very nutritious, but difficult to digest; so, big cardamoms are always added as they are considered to have a special action in the digestion of plantains. Palo, a flour made from bananas, makes nutritious but unpalatable chapaties.

COCOANUT.—Nutritious, containing 5 per cent. of proteid, 86 of fat, and 8½ of carbohydrate. It is useful in the diet of

diabetics. It is much used in the preparation of sweetmeats. Apart from sweetmeats, it is not so popular an article of diet as formerly.

WALNUTS.—Very nutritious, containing a high percentage of protein and fat.

White Europeans take fruit in the morning, the Indian custom is to take it in the afternoon.

FRUIT SOUP.—Take equal quantities of dried fruit, such as prunes, peaches, apricots, raisins and pears; wash them carefully and put to soak in cold water for two hours, well covered. Put on to cook over a slow fire in the same water as they were soaked. Add a small stick of cinnamon. Allow to cook until tender, but not mashed or broken. Add two teaspoons sago; cook until clear. Sugar to taste. Remove from fire when juice is rich and thick and when cold add two cups of orange or grape juice. Serve cold.

SICK-ROOM RECIPES

Everything used in preparing food or drink for the sick should be scrupulously clean. Iron and tin saucepans are to be avoided; those lined with enamel are preferable, and, in most cases, a double saucepan can be used, which avoids the risk of burning the milk or other food that is being cooked. It should be remembered that sick people generally like less flavouring, whether salt or sugar, than is put in ordinary cookery.

ALBUMEN WATER

Take the white of an egg, remove the specks, and beat it thoroughly. Add it to half a pint of water and again beat. Strain before use. If this is given to a baby, it should be sweetened.

ARROWROOT

Take a dessertspoonful of the best arrowroot, make into a smooth paste with a little milk, boil half a pint of milk with a lump of sugar, and pour it, while boiling, on the arrowroot, stirring quickly all the time.

It may be flavoured with lemon essence or with a little sherry, but it is generally preferred plain.

Water arrowroot is made in the same way, using water instead of milk, and it is better not sweetened; but, according to taste, it can be flavoured with lemon and sugar, or with salt or brandy.

BAEL DRINK

One or two tablespoonfuls liquid extract of unripe Bael fruit (Liq. Balæ) to a pint of water. It is used in dysentery.

BARLEY WATER

Take two ounces of pearl barley, wash it well in cold water, put it into a saucepan with a pint and a half of cold water, bring it to the boil and let it simmer gently for half an hour. Strain before use.

If wanted as a drink, and not as an addition to milk, it may be flavoured with lemon and sugar.

BEEF-TEA

Take a pound of freshly killed lean beef. Cut it small, and put it with a pint of cold water into a covered jar, in a warm oven, until it is cooked. Or it may be cooked in a saucepan over a fire, but it must only simmer, and should not be boiled. Skim it now and then, and stir, whether in a jar or a saucepan. Pour off the beef-tea, when cooked, through a strainer with large holes in it, through which the sediment can pass, and let it stand in a shallow dish till quite cold, when the fat can be removed in a solid cake. A pound of beef ought to produce a pint of beef-tea. If it is boiled down to a smaller quantity, it will be a jelly when cold, and some invalids prefer it in that form.

When it is warmed for use, flavour it with salt and pepper. Celery seed, or even a very little onion may be used occasionally to vary the flavour.

Beef-tea is served, when solid food is allowed, with very thin crisp dry toast, cut into fingers or squares.

BENGER'S FOOD

It is made according to the directions on the tin it is sold in, or by occasionally using chicken broth in place of milk.

BLANC-MANGE

Dissolve one ounce of fine isinglass in a pint of milk, strain it through fine muslin, and put it into a clean saucepan with an ounce of pounded sugar and the thin peel of a lemon. Let it warm very gently till it is nearly boiling, and then take out the lemon peel, and pour it into a wetted mould.

BREAD JELLY

Soak bread-crumbs in water or milk for one hour. Boil it in water, sufficient to cover it well, for another hour, with the addition of a little sugar and flavouring. Strain it through muslin or a fine sieve into a shape, and let it stand till cold. It should turn out of shape like blanc-mange.

BROTH

Mutton, chicken, and veal broths are made in the same way as beef-tea, in a saucepan over the fire. The broth must be well skimmed. An old fowl will answer the purpose very well, or the lean part of a neck of mutton. The bones are not removed from the meat.

COCOA

All cocoa is much nicer, if made with boiling milk instead of water, and if it is boiled again for a minute or two before being served.

CORNFLOUR BLANC-MANGE

Take two ounces of cornflour, one ounce of sugar, and one pint of milk. Mix the cornflour with a little milk into a smooth-paste, and boil the rest of the milk with the sugar and a few drops of almond, vanilla, or other flavouring. Pour the mixed cornflour into the boiling milk, stirring it quickly till it is thickened. Pour it into a mould that has been moistened with cold water.

CURDS AND WHEY

Put a pint of new milk in a glass dish, stir into it about two drachms of fluid rennet, and let it stand in a warm place until set.

If it is intended for use as a pudding, the milk should be sweetened before the rennet is added; and when it is set and cooled, a little nutmeg and a few spoonfuls of whipped cream may be carefully placed on the top.

CUSTARD PUDDING, BAKED

Beat two eggs in a basin or pie dish, stir into it about half a pint of cold milk, sweeten it, grate a little nutmeg on the top, and bake it in a rather slow oven until it is set. Do not move the dish about while it is baking, or it will not set firm; and it will not be a success if the oven is so hot that the custard boils.

CUSTARD PUDDING, BOILED

Warm five ounces of milk with a lump of sugar and a piece of cinnamon, fresh lemon peel, or a grate of nutmeg. Stir into it a well-beaten egg. Put it all into a mug, and place the mug in a saucepan of boiling water, stirring the custard round, always in the same direction, till it thickens. It will probably take a quarter of an hour to thicken. Pour it into small glasses before serving.

A savoury custard is made in the same way, using strong beef-tea and salt instead of milk and sugar.

EGG-FLIP

Take the yolk of an egg, beat it up well with an ounce of milk, and add to it two ounces of port or half an ounce of brandy, sweeten it, and grate a little nutmeg over it according to taste. It can be used either cold or warm, but must not be boiled.

EGGS, SCRAMBLED

Beat up two eggs in a basin with a little pepper and salt. Melt a piece of butter the size of a walnut in a small saucepan, put in the egg, and stir with a spoon till nearly set. Serve on buttered toast on a very hot plate.

IMPERIAL DRINK

Take one drachm of cream of tartar, the juice of a lemon, and about a quarter of a pound of loaf sugar. Mix in a jug and pour upon it a pint of boiling water. It is a refreshing drink for feverish patients, and is often ordered in cases of Bright's Disease. If it is sweetened with saccharin instead of sugar, it can be given to diabetic patients.

LEMONADE

Peel three lemons very thinly, so as to remove only the yellow part of the rind; pare off all the white, cut the pulp into thin slices, removing the pips, put the pulp into a jug with as much of the rind as required, add about half a pound of loaf sugar and pour on it about a quart of boiling water. More sugar or water can be added afterwards, according to taste. It is very good when drunk quite hot, or it can be used with a lump of ice in it as a cold drink.

LIME-WATER

Shake up washed calcium hydroxide (slaked lime) 50 in distilled water 5,000, and siphon off. To be kept in green glass bottles. Strength: $1/10$ gr. in 110 m (0.1 grm. in 100 millilitres).

LINSEED TEA

Put half an ounce of whole linseed, with a pint of boiling water, into a covered jar. Leave it by the side of the fire, or in a cool oven, for two or three hours. Strain it, and flavour it to taste with lemon and sugar, adding more hot water if it is too thick. It should be used quite hot, and it is very grateful to a sore throat or chest.

MEAT JUICE, RAW

Scrape $\frac{1}{4}$ lb. of lean beef into a saucer. Cover with cold water and leave for an hour in a cool place protected from dust. Then strain through muslin.

MEAT JUICE, SUBSTITUTE FOR

Mix the white of an egg with two ounces of cold water. Strain it and flavour it with a little Liebig's essence, dissolved in a drachm of hot water.

OATMEAL DRINK

Boil a good tablespoonful of Scotch oatmeal, in a quart of water for about twenty minutes, stirring it now and then. Add ginger, lemon and sugar, according to taste. It is a refreshing drink for thirsty patients, and there is a small amount of nourishment in it.

OATMEAL MILK

Tie a dessertspoonful of oatmeal in muslin, put it in half a pint of milk until the milk boils, then flavour with a little salt.

OATMEAL PORRIDGE

Boil one pint of water in a saucepan, and while it boils, sift in the dry oatmeal with one hand, while you stir with the other. Boil it for half an hour or longer. It must be stirred the whole time, unless it is made in a double saucepan. Serve in a soup plate, with a jug of milk or cream, and sugar, salt or treacle, according to taste.

PEPTONIZED MILK

Take one pint of milk, five ounces of boiling water, one drachm of pancreatic solution, twenty grains of bicarbonate of soda. Put it in an enamelled saucepan (a double one is best) near the fire, at a temperature of 140 degrees, for twenty minutes, then boil it up, and, as soon as it has reached boiling point, pour it off into a jug or basin, and stand it in a cold place. It should cool quickly, otherwise it will get bitter.

TO PEPTONIZE MILK WITH FAIRCHILD'S POWDERS

To one pint of cold milk, add $\frac{1}{4}$ pint of water, and a measure of the powder. Mix well together and stand in a basin of hot

water for twenty minutes. When cold pour into a saucepan and bring to boiling point.

TAMARIND WATER

A very refreshing drink may be made, by adding a pint of hot water to a tablespoonful of preserved tamarinds, and setting aside to cool.

TOAST WATER

Take a slice of stale bread or bottom crust of a loaf, toast it carefully without burning, put it in a jug and pour over it boiling water; let it stand to cool

TO QUENCH THIRST

A very weak infusion of Cascarella bark, with a few drops of dilute Hydrochloric Acid added, will be found effective in allaying thirst during febrile conditions.

WATER GRUEL

Mix two small tablespoonfuls of groats or fine oatmeal in a little cold water till it is a smooth paste: add to it half a pint of boiling water, stirring it well, and boil it for a quarter of an hour. Milk gruel is made in exactly the same way, only substituting milk for water.

WHEY

The milk is warmed to not more than 194°F., rennet powder, liquid rennet, or a solution of commercial junket tablet is added in the proportions directed on the label, as in the making of junket. It is sufficiently coagulated in thirty minutes; the *coagulum* is then broken up with a fork and strained through muslin. 1½ pints of milk will yield 1 pint of whey, which contains rather more protein and fat than that obtained in the process of cheese-making.

WHEY, WHITE WINE

Boil half a pint of milk, pour into it a wineglassful of sherry, and stir till it curdles. Strain before serving. Hot water may be added, to make it any desired strength.

HOW TO ALTER COW'S MILK TO MAKE IT LIKE HUMAN MILK

- (1) The casein, or curd, is three times as great in cow's milk.

- (2) The fat is in approximately the same proportion.
- (3) Human milk contains much more sugar.
- (4) The curd of cow's milk is in larger and harder masses.
- (5) Cow's milk is acid, from bacteria, while human milk is alkaline or only slightly acid.

Make the following Mixture:—

Cow's milk	...	...	...	...	1½ oz.
Cream (15 per cent.) (Fresh milk to stand for 6 hours, and the cream skimmed off)	...	...	...	...	1 oz.
Barley water or lime-water (<i>See Sick-room Recipes</i>)					½ oz.
Solution of Sugar of Milk (3 oz. milk sugar to Oj water)	...	..	...	..	1½ oz.
Soda Citrate	...	..	..	...	3 gr

Dilution of cow's milk reduces the proportion of casein, fat (cream) has to be added to make up for the dilution, and sugar must be added, as human milk contains a much higher percentage.

Barley water mechanically divides the curd of cow's milk, and makes it flocculent

Lime-water makes the curd more flocculent and diminishes the acidity.

Citrate of Soda, 1 gr. to every ounce of milk, also makes the curd more flocculent.

Cow's milk is acid from bacteria, and these are destroyed by pasteurization or sterilization.

ALCOHOL

Of all alcoholic drinks, the principal constituent by which they affect the nutrition of the body is Ethyl Alcohol. Alcohol not only increases the vigour of the stomach movements, but it also stimulates very powerfully the secretion of gastric juice; while it exercises this influence in health, the action is more marked in certain diseases. Alcohol requires no digestion, and, unlike water, is rapidly absorbed by the mucous membrane of the stomach, passing at once into the blood. To obtain the greatest benefit from alcohol in disease, it should be given well diluted, in small doses at frequent intervals.

The following is the amount of Ethylic Alcohol by volume in:—

	Per cent.
Alcohol Absolutum	99
Alcohol (U.S.P.)	94
Spiritus Rectificatus	90
Alcohol Dilutum (U.S.P.)	64.5
Whiskey	51 to 59
Rum, Gin, Strong Liquors	51 to 59
Proof Spirit (Spiritus Tenuior)	57.09
Brandy (Spiritus Vini Gallici)	48 to 57
Port	20 to 30
Sherry and Madeira	16 to 22
Champagne	10 to 18
Burgundy	9 to 12
Hock	9 to 12
Claret	8 to 12
Cider	5 to 9
Strong Ale or Stout	5 to 9
Beer and Porter	2 to 5
Koumiss	1 to 3

SPIRITS

WHISKEY.—Ordinary whiskey, as it reaches the consumer, is generally a blend of a spirit made from malt in pot stills, and a spirit prepared from grain in patent stills.

BRANDY.—The best brandy was originally produced in the Cognac district of France, by the distillation of wine; six or seven bottles of wine producing one bottle of brandy. It was then kept in cask for 30 or 40 years: after this period it contains a high proportion of volatile ethers and aldehydes, to which the most valuable medicinal properties of brandy are due. The greater part of brandy now sold is made from 'Silent spirit', flavoured with essences and coloured with burnt sugar.

RUM.—It is generally made by the distillation of fermented molasses produced in the manufacture of raw sugar.

GIN.—It is made by fermenting a mash of rye and malt, distilling and redistilling; juniper berries, salt, and sometimes hops, are added to the final distillation.

MALT LIQUORS

These include Beer or Ale, Porter or Stout.

BEER.—It is the product of the fermentation of malt and hops. Malt is obtained by moistening barley, and allowing it to germinate in heaps at a moderate and regular temperature.

STOUT.—It is made in the same way as beer, but its dark colour is due to caramel produced by first roasting the malt in cylinders.

WINES

Wine is made from the pure juice of the grape by fermentation.

DRY WINES.—These are non-sweet wines.

PLASTERED WINE —This has been treated with gypsum to clear it, with the result that the tartrates are removed.

RED WINES.—These are made from the whole grape; the pigment coming from the skins.

SPARKLING WINES.—These have undergone a secondary fermentation by the addition of sugar.

WHITE WINES.—These are made from the juice of grapes.

An important division of wines is into:—

- (1) **NATURAL WINES**, which are those in which fermentation has been allowed to go to its full limit; and
- (2) **FORTIFIED WINES**, which are wines in which spirit has been added to prevent further acetic fermentation.

The former are usually sweet and of high alcoholic strength, while the latter are usually poor; both are poor in sugar and alcohol.

CLARET.—This is pure natural wine containing 8 to 12 per cent. alcohol, only $\frac{1}{2}$ per cent. sugar and moderate amount of acids.

BURGUNDY.—This is similar to claret, but richer in alcohol and in extractive matter which gives it more body.

HOCKS.—Their acidity is more apparent than real, and contain practically no acetic acid.

AUSTRALIAN AND CALIFORNIAN WINES.—These are full-bodied natural wines, chemically pure and containing rather more alcohol than most clarets.

SHERRY.—It is a term applied to all the white wines of Spain, all sherries are both 'fortified' and plastered. The percentage of sugar is low, and the acidity lower than most natural wines. Old sherry is valuable in treatment in that it develops a higher proportion of volatile ethers than any other alcoholic liquor, with the exception of genuine cognac.

PORT.—This is fortified, contains a large amount of 'extract,' 2 to 6 per cent. of sugar, tannic acid and more acetic than tartaric acid.

MADEIRA.—It resembles sherry and contains a high proportion of volatile ethers.

CHAMPAGNE.—This is made from the juice of black grapes; it undergoes two fermentations, the first in cask and the second in bottles for 2 years: during this period a constant temperature is most important. At the end of two years, the deposit in the neck of the bottle is fixed to the cork by freezing and removed. The wine, which is sour and harsh, is rendered drinkable by 'dosage,' which consists in adding a solution of cane sugar dissolved in old champagne and good cognac.

A bottle contains about 5 volumes of carbon dioxide gas.

Champagne is a wonderful stimulant and restorative and has saved untold lives by turning the scale at a critical time.

COUNTRY LIQUOR.—It is made by the fermentation of molasses, and, in some parts of the country, from cocoanut, dates, rice, and palm juice. It is sold at the fixed strengths of 25° and 50° underproof.

PROOF-SPIRIT.—This is defined, by an Act of Parliament, as 'being such as shall, at a temperature of 51°F., weigh exactly 12/13 part of an equal measure of distilled water.' Weaker spirits are termed 'underproof' and stronger spirits 'overproof.' Thus, '25 degrees overproof' means a mixture of alcohol and water in such proportion, that 100 volumes of this mixture, when diluted with water, to make the mixture proof-spirit, yields 125 volumes of proof-spirit; and '25 degrees underproof' means a mixture of proof-spirit and water containing, in 100 volumes, 75 of proof-spirit and 25 of water.

MINERAL WATERS

EUROPEAN MINERAL WATERS

APENTA (NEAR BUDA-PESTH).—Aperient: contains—Magnesium, Sodium and Calcium Sulphates, Sodium Chloride with small quantities of Lithium and Potassium Sulphates.

Used in—habitual constipation, hepatic torpor and congestion, hæmorrhoids, gall-stones, gout and uric acid diathesis

APOLLINARIS (NEUENAHR, GERMANY).—Alkali table water.

Contains—Sodium Chloride, Calcium and Magnesium Bicarbonates with large excess of Carbonic Acid.

Used in—catarrhal affections of the respiratory organs, mucous membranes and gravel.

CARLSBAD (BOHEMIA).—Several similar springs; that known as Sprudel is the most favoured.

Alkaline, Lithiated.

Used in obesity, constipation, stomach, intestinal, liver, kidney and bladder disorders; gout and diabetes.

CONTREXEVILLE (VOSGES, FRANCE).—Pavillon Spring.—Alkaline, anti-rheumatic.

Used in—gouty affections, dyspepsia, eczema, catarrh of the bladder and liver disorders.

FRIEDRICHSHALL (SAXE-METNINGEN, GERMANY).—Aperient: contains—Magnesium and Sodium Sulphates, Sodium Chloride.

Used in—constipation, intestinal complaints, biliary disorders, gall-stones, gravel, gout, an active diuretic, and for hæmorrhoids.

FARROGATE (YORKSHIRE).—Sulphurous—Sulphur and Alkaline Carbonates compose half the solid ingredients.

The Beckwith Spring contains large proportion of Magnesia.

Helium has been traced in the gases rising, hence presence of Radium is assumed.

Used in—skin and rheumatic affections, anæmia, dyspepsia Aperient and diuretic. Open summer and winter; also bottled.

HOMBURG-VON-DER-HÖHE (GERMANY) —Elizabethbrunnen, Kaiser-brunnen and Stanibrunnen.

Saline, chalybeate, acidulated.

Contains—Sodium and Magnesium Chloride, Ferrous, Calcium and Magnesium Bicarbonates, Carbonic Acid.

Used in—chronic catarrhs of stomach and bowels, habitual constipation, gout, chlorosis, inaction of the liver, diabetes and as a general tonic.

HUNYADI JANOS (BUDA-PESTII).—Aperient: contains—large percentage of Magnesium and Sodium Sulphates, Sodium Chloride, and Sodium and Calcium Bicarbonates.

Used in—constipation and biliousness.

R Sodium Sulphate	...	...	...	gr. 80
Magnesium Sulphate	...	...	...	gr. 80
Sodium Chloride	..	..	...	gr. 1
Sodium Bicarbonate		...	...	gr. 1

When dissolved is a good imitation. (H.W.)

PERRIER (FRANCE).—Table water, slightly mineralized, organically pure. Small portion of Alkaline Carbonates. Digestive.

VICHY (FRANCE).—Springs, Alkaline, acidulated.

Used in—gravel, chronic urinary affections, diabetes, female complaints, gout, rheumatism. Facilitates digestion, also renal elimination, but does not appeal to English visitors.

WOODHALL (LINCOLNSHIRE).—Saline, Bromide, Iodine (free and combined), Sodium Chloride, Arsonic.

Used in—gout, sciatica, rheumatism, skin affections, goitre, women's diseases.

INDIAN MINERAL WATERS

SIPRI (GWALIOR STATE).—The following is an analysis of the Sipri Spring water:—

				Per cent.
Calcium Carbonate	...	...	...	7.53
Magnesium Carb.	...	...	...	1.09
Sodium Carb.	...	...	...	7.77
Sodium Nitrate	..	...	...	0.245
Sodium Sulphate	...	...	...	0.199
Sodium Chloride	..	...	...	1.49
Silica	...	...	...	0.56

It is reported to be very useful in chronic constipation and dyspeptic troubles.

GILGIT.—

Total solids	...	...	...	7 gr. per gallon.
Total hardness	...	...	..	4 gr. per gallon.
Calcium	...	...	About	6 gr. per gallon.
Free Ammonia and organic matter	...	...	...	Nil.

Goitre does not occur among the coolies who drink this pure water of the Gilgit river.

*Mineral Waters exhibited at the Indigenous Drugs
Exhibition, Agra, 1917*

- (1) Bridh Kal Spring water—Hartirath, Benares City.
Properties—Purgative, digestive and diuretic.
Dose—One tumblerful.
- (2) Gailia Spring water—2 miles south-west of Benares.
Properties—Digestive.
- (3) Sarang Well water—2 miles north of Benares.
Properties—Digestive.
Dose—One tumblerful.
- (4) Lulani Spring water—Haripur, 16 miles from Kangra.
Contains Iodine. Used for constipation, goitre and enlarged spleen.
- (5) Sulphur Spring water of Sahansar Dhara, near Rajpur, district Dehra Dun.
- (6) Sohna Sulphur Spring water—Sohna, district Gurgaon.
As a bath is useful for all skin diseases and Delhi sore.
Internally given for rheumatism and liver complaints.
- (7) Lasundra Sulphur Spring water, from Kaira district.
- (8) Pure Ganges water from Bhimgoda near Hardwar.
Digestive; very useful for dyspepsia and chronic disorders of the digestive system.

INDIAN MINERAL AND THERMAL SPRINGS.—

Dr. J. Macpherson gave a full list of all the mineral springs in the 'Indian Annals of Medical Science,' No. III, Calcutta, 1854.

A very full list of the Thermal springs was published by Dr. Oldham, Superintendent of the Geological Survey of India, in the 'Memoirs of the Geological Survey of India,' Vol. XIX, Part 2.

- ° Little or nothing has been done to use these springs for therapeutic purposes, and this is partly due to the fact that the majority are in distant and wild localities, difficult of access.

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Thermal Springs of India, *Ind. Med. Gaz.*, Oct., 1911.

GENERAL RULES FOR DIETING

The following general rules by Hutchison should always be thought of in drawing up any scheme of diet:—

1. In acute diseases, it is well to recommend a special plan of diet. In chronic cases, it is better to forbid those articles which are likely to prove harmful.
2. Before recommending any article, ascertain if the patient likes it, and how it agrees with him.
3. No article should be forbidden, unless there are good reasons for doing so.
4. Unless there is some strong contra-indication, attention should always be paid to the wishes and tastes of the patient. This is especially important with Indian patients.
5. If any article of food disagrees, reduce the quantity rather than forbid it entirely.
6. Changes of diet should, if possible, be made gradually.
7. Never prescribe a diet without first ascertaining the patient's habits as regards work and exercise.

NOTES FOR GUIDANCE OF INDIAN PRACTITIONERS IN THE TREATMENT OF EUROPEAN PATIENTS

1. The blandest diet is albumen water, barley water, and whey; the next is peptonized milk; and then cow's milk, diluted with plain water, soda water, barley water or lime-water, the quantity of the diluent being gradually reduced, until the patient is on a diet of whole cow's milk or Horlick's malted milk.

2. Next in order comes raw meat juice, or chicken jelly, mutton or chicken broth, which, later on, may have toast or a little well-cooked rice soaked in it. Beef-tea is more difficult of digestion, and liable to cause or increase diarrhoea.

3. The patient may next be allowed what is known as glass custard, or egg-flip, with or without a little brandy, which improves the taste and power of absorption, or one of the patent foods such as Mellin's or Benger's, or arrowroot, in the absence of flatulence.

4. Then, boiled custard, scrambled eggs, and, a little later, baked custard pudding, and lightly made cornflour blanc-mange.

5. Next, well-cooked oatmeal porridge and milk, poached and lightly boiled eggs, bread and butter, strawberry jam.

6. Chicken cream or quenelle (a mixture of pounded chicken and cream), boiled fish with or without plain white sauce.

7. Minced chicken.

8. Boiled chicken, pigeon or quail (cooked in any way except roasted).

9. Roast chicken and bread sauce, boiled mutton, and finally roast mutton and beef. Veal is seldom obtainable in India and is very indigestible. Ham is easily digested, and is an excellent form of meat during convalescence.

10. As regards vegetables, well-cooked spinach (palak), or cauliflower (phoolgobi) is the best for invalids, followed by potato (especially mashed potato), onion (pyaz), turnip (shalgam), carrot (gajar), and cabbage (band gobi), peas (mutter) and beans (phalee), radish (mooli) and cucumber (kakri) are very indigestible.

11. The best fruit in acute disease are grapes and oranges, followed, in convalescence, by stewed apples, apricots or peaches. Figs (anjir), pineapple (annanas) and cocoanut (gola) are very indigestible.

12. Stimulants.—Tea is light and stimulating, and can be taken in almost all acute conditions, including enteric. China tea causes less digestive disturbance than India or Ceylon tea. Coffee is a good stimulant (especially if given strong per rectum), but causes biliousness with some people, and cocoa even more so.

It is well known that if alcohol is suddenly stopped as the result of illness or accident, a person who takes it in excess is very liable to develop Delirium Tremens; it is, therefore, advisable to give whiskey or brandy in moderation.

The guiding principle, in acute conditions such as enteric, should be to withhold stimulants as long as possible, in order to have this help for a failing heart at the most critical period of the illness. As much as 10 oz. of whiskey or brandy can then be given in the 24 hours, varying it according to the age of the patient, his previous alcoholic history, and the condition of the heart.

Champagne (iced) is excellent, the only objection being expense. During convalescence, burgundy, the Australian claret ('Sauvignon') and port are useful tonics; stout is especially recommended for women during lactation.

INSTRUCTIONS FOR PREPARATION.—See Sick-Room Recipes.

DIET IN CERTAIN DISEASES.—See *infra*.

DIET IN CERTAIN DISEASES

See ALSO INDEX OF TREATMENT.

ALCOHOLIC CIRRHOSIS OF THE LIVER

Early cases—those, for example, which first indicate trouble by an attack of hæmatemesis—have been wonderfully benefited, in my practice, by a course of peptonized milk for three months, followed by a milk diet for another six or nine months, and those cases in which the patient has given up alcohol entirely, appear to be completely cured.

AMŒBIC OR BACILLARY DYSENTERY, ACUTE

The treatment by diet is of great importance; the bowel requires physiological rest, and the diet should be limited to whey and albumen water. Only small quantities should be taken at a time, very slowly, and lukewarm.

CARDIAC DISEASE

Considerable help can be given by dieting when the heart's action is impaired. Food should be given in small quantities at short intervals; it should be easily digested, dry and non-flatulent; to this end, carbohydrates should be strictly limited, also fats. The importance of a dry diet is insisted on by all writers for the following reasons.—

(1) The rapid absorption, into the circulation, of a large amount of fluid throws a mechanical stress on the heart.

(2) Fluids, in heart disease, are slowly absorbed and therefore cause distension and flatulent dyspepsia.

(3) By withholding liquids, the blood becomes more concentrated, and water then passes from the dropsical tissues into the blood, instead of *vice versa*. The total fluid, therefore, should be limited to about 20 oz., and not more than 3 or 4 oz. should be taken at a time.

CHOLERA

No food whatever should be given during the acute stage: only liquids, as water and soda water, in very small quantities at a time. Stimulants should be given very sparingly, if at all, by the mouth. When reaction sets in, the return to food must be made with great caution. Begin with very thin barley water, then thin arrowroot, whey, peptonized milk diluted with barley water, and so to pure milk, every increase being made slowly, and with great care.

CHOLECYSTITIS

Yolk of egg and all food containing yolk of egg must be absolutely avoided. Cream, butter and fats strictly limited. Pork, soups and pastries should not be taken. But the patient may take an ample amount of green vegetables and non-acid fruit.

DIABETES—*See* Index of Treatment

DIARRHŒA

ACUTE.—If very severe, stop all food for 24 to 48 hours. only barley water in sips being given for thirst. Then weak arrowroot or cornflour, next milk and lime water. Avoid meat extractives, and see that nothing is given which is either very hot or cold, as unless lukewarm, peristalsis will be stimulated.

CHRONIC.—Avoid fruit and green vegetables as these leave a bulky residue. Hot liquids and alcohol should not be taken. Milk should be given with lime water.

MILK DIARRHŒA.—Milk.

DIARRHŒA, INFANTILE

The danger of this disease lies in the rapid withdrawal of water from the body with consequent prostration and collapse. A most successful method recently introduced is to induce the child to drink large quantities of normal saline. This should be kept in an ordinary feeding bottle, and frequently given to the patient. The resulting increase in weight bears testimony to the efficacy of this treatment. Milk must be immediately and completely stopped. When the child is better, whey may be given, but return to milk gradually and with great caution.

DYSENTERY, CHRONIC

Milk diet is of the first importance, and may be supplemented by sour milk treatment

Food should be taken in small quantities not more than 4 oz. every 2 hours, it must be taken slowly and lukewarm.

FATTENING DIET

This is required in:—

- (1) Wasting diseases such as tuberculosis;
- (2) Convalescence from acute illness; and
- (3) Nervous disorders such as neurasthenia.

Increase the proportion of fat and carbohydrate in the diet. One of the simplest ways is by the addition of milk and cream; butter, bacon and suet are also useful.

Rest, more or less complete, is always an important aid

FEVERS

Whereas the older method was one of starvation, the present-day method consists in feeding a patient up to the limit of his digestive capacity, with fluid or semi-fluid food. Freely giving food does not tend to raise the temperature, and the absorption of light food is as perfect in the febrile as in the afebrile state. There should be a liberal supply of carbohydrate, and this may conveniently be done by fortifying the milk.

GASTRIC AND DUODENAL ULCER—*See* Dr. Hurst's diet in the General Index of Treatment.

GASTRITIS

Avoid alcohol except, if desired later on, a small quantity of light wine or diluted whiskey at meals.

In making tea the boiling water should not be allowed to remain in contact with the tea-leaves for longer than three minutes.

Avoid coffee. Avoid liver, sweetbreads, kidney, roe, brain, salmon, plaice, halibut.

Avoid pips and skins of fruit (whether raw, cooked, or in jam, and currants, raisins, and lemon-peel in cakes), nuts and unripe fruit. For example, an orange may be sucked but not eaten. Currants, raisins and figs are particularly undesirable, and all fruit is better stewed than raw. Marmalade only in the 'invalid' form; red currant, apple and other fruit jellies, and damson cheese allowed, but no ordinary jams.

Avoid potatoes, onions, turnips, carrots, parsnips.

Avoid all raw vegetables, whether taken alone (celery, watercress) or in pickles or salad; green vegetables must be passed through a sieve and mixed with butter in the form of a purée, and other vegetables are best in purée form. Porridge is only allowed if made with the finest oatmeal.

Avoid vinegar; sour fruit; pepper, mustard, curry, chutney; new bread; tough meat, pork, made-up dishes, high game.

Abundant butter and cream, honey and golden syrup, and eggs (except hard-boiled) should be taken. (New Lodge Clinic.)

GOUT, ARTERIO-SCLEROSIS AND HIGH BLOOD PRESSURE

We are, unfortunately, still very much in the dark as to the relations of uric acid to general metabolism and the gouty state. There is no routine plan which is suitable to all cases, and each particular case must be studied on its own merits. The following should be allowed or forbidden:—

<i>Allowed</i>	<i>Forbidden</i>
Chicken, pigeon, quail (in moderation).	All meat extracts, and essences.
Fish, eggs, vegetable soups.	Rich gravies, sauces and spiced food.
Fresh green vegetables, and fresh fruit.	Soups, food that has been re-cooked, duck, and goose.
Rice, sago, tapioca.	Sweetmeats, preserved fruit, and sugar.
Toast or stale bread.	Spices and pickles.
Potatoes and salads.	Beer, stout, burgundy—all liqueurs.
Skimmed milk, China tea.	

Allow natural mineral waters, and lime-juice well diluted. Tobacco should be limited.

OBESITY

Medicinal treatment is useless, except in those cases in which some trouble of the ductless glands exists, and dependence must be put on diet and exercise.

Treatment should be begun by reducing the fats and starches: flour, potatoes, and beans especially should be reduced to half. The effect on the heart must be watched, especially for any symptoms of tachycardia. If, after a fortnight, the patient fails to lose weight, then butter, milk, and fats should be stopped entirely, and the amount of exercise increased. These simple methods, if persisted in, are often sufficient. There are many schemes of dieting. One of the best is Von Noorden's, which consists of small but frequently repeated meals, the aim being to insure perfect digestion of all foods, while avoiding those which promote the accumulation of fat. It can only be carried out by persons having no occupation. Speaking generally, the following articles should be—

Allowed

Clear soup and broths.
 Fish, meat, poultry, eggs.
 Fruit, green vegetables.
 Stale bread or toast.
 Tea and natural mineral
 waters.

Forbidden

Thick soups, oil, ghee, cream,
 rice, sago, tapioca, oatmeal,
 potatoes.
 Peas, carrots, beetroot.
 Sweetmeats, pastry, sugar,
 milk.
 Beer, porter, port and
 liqueurs.

RENAL DISEASE

The principle aimed at is to avoid food, which, during excretion, might irritate the diseased kidneys, and at the same time diminish the amount of work that the kidneys have to perform.

ACUTE NEPHRITIS.—The best treatment is an exclusively milk diet.

SUB-ACUTE NEPHRITIS.—Milk, chicken, fish, cream, cereals, vegetables and fruit. But no alcohol and little salt.

CHRONIC NEPHRITIS.—A light nourishing mixed diet; consisting of lean meat, once daily; eggs, green vegetables, fruit and light well-cooked farinaceous articles. Fruit, pure ghee and butter are especially recommended.

RESPIRATORY DISEASES

ASTHMA.—The last meal should be small and not taken late. The diet should be dry and small in quantity. If the patient has an idiosyncrasy to any particular food this should of course be excluded.

BRONCHITIS.—Hot liquids or semi-liquids help to promote secretion from the tubes, therefore give hot tea, milk, broth, etc.

PNEUMONIA.—Diet as for acute fevers, but great care should be taken to avoid an over-loading of the stomach. Weak tea and plenty of barley or plain water.

SKIN DISEASES

In the majority of skin diseases, no special regulation of the diet is required; but in the following cutaneous lesions, a careful dieting may be of some direct help:—

ECZEMA.—In very acute cases milk alone should be given; alcohol and salt should be limited in chronic cases.

PRURITUS.—Coffee and alcohol should be avoided; also all highly flavoured, salted and preserved foods.

URTICARIA.—Fish, eggs, oatmeal, strawberries and any kind of acid fruit will cause urticaria. There is a close relation between urticaria, peptic ulcers of the mouth and migraine, due to an idiosyncrasy to certain articles of diet; in one case, I have traced this to apples, and in another, to strawberries.

SPRUE

My experience of this disease is that, except in the last stage, all cases can be cured by an absolute milk diet, with the addition of a small quantity of strawberries and cream. The reason that this treatment is so often reported to have failed, is the fact that the patient will not keep to an absolute milk diet for sufficiently long: the addition of any other article of diet, or medicine, in any form, is fatal to its efficiency. Except in the mildest cases, the treatment must be persisted in for at least six months; the amount of milk should not exceed four pints for a woman, five pints for a man, and for Indians should be somewhat less. At first, not more than twelve strawberries should be taken daily; if possible, these should be fresh; failing this, preserved fruit should be given; failing this, 'Tiptree' or 'Crosse and Blackwell' strawberry jam. After the first month or six weeks, the soreness of the tongue will have disappeared, the motions will have been reduced to one or two in number, more yellow in colour, and less bulky and less fermented. The stools will next become formed, and gradually change from yellow to brown. After three months, one to three oranges, or grapes, can be given daily; later, fresh meat juice, and last of all, carbohydrates. All medicines are useless, and should, on no account, be given. At the first sign of relapse, the patient must immediately go back to milk and strawberries, but only for a short time will this be necessary.

The patient should at first be in bed. Alcohol in all forms, and smoking, must be prohibited, and flannel clothing should be used, to avoid chills.

TUBERCULOSIS OF THE LUNGS

The patient should be given at least five meals a day. Many Indians are much underfed in this disease, as they try to retain the custom of only two meals; the patient's appetite and digestion are too feeble to enable sufficient food to be taken on only two occasions during the day.

While there should be at least five regular meals, liquid food, such as milk, should on no account be taken between the meals, as this interferes with digestion.

The food should be easily digestible, well cooked, palatable, and varied as much as possible. As much milk, cream, ghee and butter should be taken as the patient's digestion will permit. Extract of Malt and Cod Liver Oil appears to have a beneficial action apart from its food value, and should be given regularly, provided that the patient enjoys it. Comparatively high temperatures are not a bar to an ample and solid diet in this condition.

TYPHOID FEVER

As the result of recent experience, the old-fashioned milk dietary has been profoundly modified. The principles underlying the choice of dietary in this condition are:—

- (1) Avoidance of those foods which are digested or assimilated with difficulty, or which reach the lower end of the ileum in a solid state.
- (2) Avoidance of any substance liable to give rise to meteorism. Thus, green vegetables must be excluded on account of the cellulose content and their liability to cause flatulence. Milk, again, is not easily digested, and produces flatulence: it is best administered in small quantities in dilute form. Many cases of enteric, fed exclusively on a milk diet, presented, at autopsy, a firm mass of curdled milk in the lower ileum.
- (3) Supplying an easily assimilable food of high calorific value. Sugar fulfils these conditions, and should be added, as far as possible, to all fluids.
- (4) Dilution and elimination of toxins, which is best effected by inducing the patient to drink large quantities of water, barley water or lemonade. Brandy and port may also be given in small amounts.

The diet may be supplemented by lightly boiled eggs, bread and butter without crusts, custards, pounded fish, and mashed potatoes, according to the patient's appetite and his capability of assimilating food. Meat extracts have a negligible food value.

By such treatment, exhaustion is avoided, the heart muscle is supplied with the all-important carbohydrate, and convalescence is materially shortened.

ARTIFICIAL FEEDING

1. **RECTAL FEEDING.**—Nutrient enemata are now seldom given, such as the old-fashioned nutrient enema of eggs, milk, arrowroot, etc. as it is very doubtful if proteins and fats are absorbed from the rectum and colon, and recently doubt has even been cast on the possibility of the absorption of glucose.

The enemata now generally given are plain water, saline and glucose solution to which in some cases may be added alcohol or drugs.

Plain water and normal saline may be given with marked benefit in acute abdominal conditions such as peritonitis. With Ketosis as shown by Acetone and Diacetic Acid in the urine (for tests see Diagnostic Methods) and the odour of acetone in the breath, glucose enemata of a pint containing 10% Sod. Bicarb. and 10% Glucose should certainly be given. Enemata also relieve thirst and the loss of fluid from the body resulting from vomiting and hæmorrhage.

It is important to observe certain details of administration:—

1. The fluid must never be injected from an enema syringe forcibly, but allowed to run in slowly by gravity from a funnel attached to a No. 8 or No. 10 gum elastic catheter.
2. **QUANTITY AND TIME.**—Two or three pints in the 24 hours, divided into enemata of about 10 ounces each given at 6 hourly intervals.
3. **RATE OF FLOW AND TEMPERATURE.**—4 minutes should be allowed for each ounce and the temperature should be at 102°F.
4. The patient should be lying on the left side with the hips well raised, the catheter being passed about 8 inches within the rectum.
5. In the event of the rectum being irritable, a cocaine suppository should be used beforehand or Tr. Opii. m 10 added to the enema.

For those who still believe in the old-fashioned nutrient enema Burney Yeo's formula is probably the best.

R. Yolk of two eggs.
Pancreatized milk four ounces.
Arrowroot 1 drachm (first mixed with 1 ounce of warm water).
Brandy $\frac{1}{2}$ to 1 ounce.
Sodium Chloride $\frac{1}{2}$ drachm.

If it is used the rectum must be washed out daily with 1½ pints of saline, to remove the residue which is frequently very foul.

1. NUTRIENT SUPPOSITORIES.—These were formerly given alternately with nutrient Enemas; but they are not recommended being very imperfectly absorbed, and as they only contain 125 gr. of peptone, could only give 85 calories of energy if completely absorbed.

2. ŒSOPHAGEAL, GAVAGE OR FORCED FEEDING.—An ordinary soft stomach tube is employed, and introduced in the same way as for Gastric Lavage. *See* Gastric Lavage.

3. NASAL.—The tube is passed through the nose, and so down the throat.

4. GASTROSTOMY.—The food is passed directly into the stomach, through the opening made by this operation.

Œsophageal, Nasal and Gastrostomy Feeding

A daily diet for a patient confined to bed, and fed by either of these methods, should consist of:—

Milk	...	...	...	3 pints.
Milk Sugar, previously dissolved in water by boiling	...	...	...	3 ozs.
Cream	...	...	...	½ pint.
Soup	...	...	...	1 pint.

Strengthened by some proteid preparation, as Plasmon or pounded meat.

INFANT FEEDING

BREAST-FEEDING

(1) Put the child to the breast, within six hours of its birth.

(2) Put the child to the breast, twice in the first twenty-four hours.

(3) Put the child to the breast, three times during the day, and once during the night, for the second twenty-four hours. Give teaspoonfuls of water if it cries from thirst.

(4) Put the child to the breast, from the third day onwards, every two hours during the day, and once during the night.

Thus, it is fed at 8, 10, and 12 a.m.; 2, 4, 6, 8, and 10 p.m. and 3 a.m., counting from the beginning and not the end of each meal. This is the Rotunda method, and the discipline of the regularity of meals is essential for good health and temper.

(5) Wake it up, if asleep at the appointed time; if difficult to wake, or too sleepy to suck, let it remain until the next appointed hour has arrived.

(6) If a child has a tendency to sleep by day and be wakeful at night, this must be counteracted, by feeding once only during the night, and not giving way to its crying for further feeds.

(7) Be careful not to jam the child's nose against the breast, so that it cannot breathe freely, this is a frequent cause of the child being reported as too weak to suck.

Note.—In the London Hospital and nursing homes, it is usual to adopt the following method: From the third day to the end of the first fortnight, the feeds should be given at 6 and 9-30 a.m.; 12-30, 3-30, and 10 p.m. During the night, the child may be given a little water, but no milk. After the first fortnight, the times should be 6 and 10 a.m.; 2, 6, and 10 p.m. The advantage of the longer intervals is that each breast is emptied and the infant receives the last milk, with its higher nutritive value.

(8) Put the child to one breast only for a feed. The other breast is used for the next feed. If only one breast can be used, it is better to give the bottle alternately.

Twins should have one breast each, if they do not flourish, one of them must be weaned.

(9) HOW MUCH SHOULD BE GIVEN AT EACH FEED.—Let the child have as much as it will take without

possetting. Judge of the amount swallowed by the duration of the meal: if it feeds for twenty minutes and possets, feed for 15 minutes next time, and so until the longest time without possetting is found. This applies to both breast and artificial feeding. Another way is to allow the child to suck until it falls to sleep. This takes about 20 minutes.

(10) After suckling, wash the nipples with Boric lotion, and then dab them with weak spirit, eau-de-cologne or brandy and water equal parts. Before feeding, the nipples are washed with warm water.

ARTIFICIAL FEEDING

If the mother is unable to feed her baby, we have to face all the risks of artificial feeding, and these risks should be met by careful attention to the following details:—

(1) HOW TO PREPARE COW'S MILK FOR INFANT FEEDING.—See Index.

(2) During the first 24 hours, give the mixture with three parts of water for three feeds.

(3) During the next 24 hours, give the same for six feeds.

(4) Do not give the undiluted mixture until the third day, and then use it as an exact substitute for breast-feeding, as regards time and amount.

(5) The milk mixture is always sterilized before use; this is best done in a Soxhlet sterilizer; if, however, a Soxhlet sterilizer is not available, put the mixture into an ordinary bottle which has been scrupulously cleaned, and put the bottle into a saucepan of cold water. Then boil the water in the saucepan for ten or fifteen minutes, remove the bottle from the saucepan, and cool the milk rapidly by plunging the bottle into cold water. The mixture should be kept in the same bottle standing in cold water.

(6) GIVING THE BABY THE BOTTLE.—The nurse takes one of the Soxhlet bottles, warms the milk in it, by standing the bottle in warm water, removes the cap, and with clean fingers fits on a rubber teat. The baby is fed straight from the bottle.

The baby must always be fed on the nurse's arm; never allowed to suck the bottle in its cot, sleep, wake, and suck again. If no Soxhlet apparatus is available and ordinary feeding bottles are used, they must be boat-shaped, never have any rubber tubing, and two should always be kept in use.

(7) HOW TO KEEP THE BOTTLES AND NIPPLES CLEAN.—This is a very important part of baby-feeding, and there is no more common cause of infantile illness. The bottles are scalded inside and outside before and after feeds, and kept in a solution of soda.

The nipples are scrubbed before and after each feed, with soap and water, inside and outside, and boiled once a day and kept in soda solution.

MIXED FEEDING

If a baby does not gain weight on breast-feeding alone, it is sometimes advisable to give a bottle feed once a day, with a little Mellin's or Benger's Food, and the same for the night feed.

SPOON-FEEDING

Children with unoperated cleft palate or bad harelip, and with syphilitic and painful ulceration round the mouth, must be spoon fed.

TABLE OF INTERVALS AND QUANTITY AT EACH FEED

Age		Intervals by Day in Hours	Night Feeds	Quantity at each Feed in oz.
1 week	...	2	1	1 to 1½
2 to 3 weeks	...	2	1	1½ to 3
3 to 5 weeks	...	2	1	2½ to 3½
6 to 12 weeks	...	2½	1	3 to 4½
3 to 5 months	...	3	1	4 to 5½
5 to 9 months	...	3	...	5½ to 7
9 to 12 months	...	3½	...	7½ to 9

DHAIS OR WET-NURSES

The only place, from which I am aware that wet-nurses can be generally obtained, is Agra. There are several agents by whom they are supplied, and they have been sent out by the Civil Surgeon of Agra since 1854. These women are all Hindus, caste Koli. As the demand is always far greater than the supply, they are a somewhat troublesome class. In the event of a Dhais being required, an advance of about Rs. 50 should be telegraphed, with particulars as to the age of the child for whom the Dhais is required, the caste of the employer, and the full address.

TABLE SHOWING THE COMPOSITION OF THE CHIEF INFANT FOODS

Food	Water %	Protein %	Fat %	Carbo- hydrate %	Mineral matter %	REMARKS
Dried Human Milk ...	...	12.2	26.4	52.4	2.1	The standard of composition, to which artificial substances should conform.
Allenbury, No. 1 (for children below the age of three months).	5.7	9.7	14.0	66.85	3.75	Desiccated cow's milk, from which the excess of casein has been removed, and a certain proportion of soluble vegetable albumen, milksugar and cream added. No starch present. Half an ounce in 3 ounces of water for a child aged three months.
Allenbury, No. 2 (for children of the age of three to six months).	3.9	9.2	12.3	72.1	3.50	Resembles the above, but contains some malted flour in addition. No starch present. One ounce in 6 ounces of water for a child aged six months.
Horlick's Malted Milk	3.7	13.8	9.0	70.8	2.70	A mixture of desiccated milk (50 per cent.), wheat flour (26½ per cent.), barley malt (23 per cent.), and bicarbonate of soda (½ per cent.), contains no unaltered starch when mixed. Three teaspoonfuls (equals 22 grammes) in 4 ounces of water for a child aged three months.
Carrick's Soluble Food	5.3	13.6	2.5	76.2	2.20	A mixture of desiccated milk (37½ per cent.), malted wheat flour (37½ per cent.), and milk sugar (25 per cent.). When prepared according to directions, the casein is partially digested, but a considerable amount of unchanged starch is left. One part to be mixed with nine parts of water, and boiled for a few minutes.

Glaxo	...	3.5	22.2	27.4	41.0	5.90	Prepared from dried milk, with the addition of cream, fat and lactose—all the carbohydrate in the form of milk sugar.
Mellin's Food	...	6.3	7.9	Trace	82.0	3.80	A completely malted food. All the carbohydrate in a soluble form. May be regarded as a desiccated malt extract. Half a tablespoonful (about 5 grammes), quarter-pint of milk, and quarter-pint of water for a child under the age of three months.
Savory and Moore's Food	4.5	10.3	1.4	83.2	0.60	Composed of wheat flour with the addition of malt. When prepared according to directions, most (but <i>not all</i>) of the starch is converted into soluble forms (chiefly dextrins). One or two tablespoonfuls (equals from one to two ounces) to be mixed with two or three tablespoonfuls of cold milk or milk and water, and one-third pint of boiling milk or milk and water to be added.	
Benger's Food	...	8.3	10.2	1.2	79.5	0.80	A mixture of wheat flour and pancreatic extract. When prepared according to directions, most but not all of the starch is converted into soluble forms. The proteid is also partially digested as well as that of the milk used in mixing it. One tablespoonful (about 1 ounce), and four tablespoonfuls of cold milk, then add half a pint of boiling milk and water; set aside in a warm place fifteen minutes, then bring to the boil.
Allenbury's Malted Food	6.5	9.2	1.0	82.8	0.50	A mixture of wheat flour and malt. When prepared according to directions it still contains some unaltered starch. Designed for children above the age of six months. One tablespoonful (about 1 ounce), a teaspoonful of sugar, and three tablespoonfuls of cold water; mix and add half-a-pint of boiling milk and water (equal parts).	

TABLE SHOWING THE COMPOSITION OF THE CHIEF INFANT FOODS—(Concl'd.)

Food	Water %	Protein %	Fat %	Carbo- hydrate %	Mineral matter %	REMARKS
Ridge's Food	... 7.9	9.2	1.0	81.2	0.70	A baked flour, containing only 3 per cent. of soluble carbo- hydrates, the remainder being starch. Recommended to be made with milk or water. Made with water alone is totally insufficient food.
Bananina ...	... 9.5	4.1	0.4	84.0	2.07	A highly starchy food prepared from banana flour.
Robinson's Patent Barley	10.1	5.1	0.9	82.0	1.90	Ground pearl barley, poor in every element, except starch and mineral matter.

**SCALE OF DIET FOR EUROPEAN PATIENTS IN HOSPITALS OR DISPENSARIES AND
MENTAL HOSPITALS**

Articles	Full diet	Half diet	Chicken diet	Low diet	Milk diet
Meat ...	12 ozs.	8 ozs.	nil	8 ozs.	nil
Bread ...	12 "	8 "	8 ozs.	4 "	"
Chicken ...	nil	nil	one	nil	"
Vegetable ...	12 ozs.	12 ozs.	12 ozs.	"	"
Dal ...	2 "	2 "	2 "	"	"
Rice ...	3 "	3 "	3 "	"	"
Tea ...	$\frac{1}{4}$ oz.	$\frac{1}{2}$ oz.	$\frac{3}{4}$ oz.	$\frac{1}{4}$ oz.	"
Sugar ...	4 ozs.	4 ozs.	4 ozs.	4 ozs.	2 ozs.
Milk ...	12 "	12 "	12 "	2 lbs.	4 lbs.
Butter ...	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	1 oz.	1 oz.	nil
Spices, salt, pepper, and onion	3 pies	3 pies	3 pies	3 pies	"
Fruits or pudding "	2 annas	2 annas	2 annas	1 anna	"
Eggs ...	Two	Two	Two	Two	"
Ghee ...	2 ozs.	2 ozs.	2 ozs.	nil	"
Quaker oats or sago and sujee ...	1 oz.	1 oz.	1 oz.	1 oz.	"
Charcoal for cooking ...	3 lbs.	3 lbs.	3 lbs.	3 lbs.	1 lb.

SCALE OF DIET FOR INDIAN PATIENTS IN HOSPITALS OR DISPENSARIES

Articles	Full diet meat		Full diet Atta		Full diet rice		Full diet Atta, rice		Low diet		Half diet Atta		Half diet rice		Milk diet		Spoon diet	
	Md.	Sr.	Ch.	Md.	Sr.	Ch.	Md.	Sr.	Ch.	Md.	Sr.	Ch.	Md.	Sr.	Ch.	Md.	Sr.	Ch.
Atta ...	0	0	10	0	0	10	0	0	6	0	0	6	0	0	6	.....	.....	.....
Dal ...	0	0	1	0	0	2	0	0	1	0	0	2	0	0	2	.....	.....	.....
Mutton ...	0	0	3	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vegetables ...	0	0	3	0	0	3	0	0	3	0	0	3	0	0	3	.....	.....	.....
Ghee ...	0	0	$\frac{1}{2}$	0	0	$\frac{1}{2}$	0	0	$\frac{1}{2}$	0	0	$\frac{1}{2}$	0	0	$\frac{1}{2}$	.....	.....	.....
Salt ...	0	0	$\frac{5}{6}$	0	0	$\frac{1}{2}$	0	0	$\frac{2}{5}$	0	0	$\frac{2}{5}$	0	0	$\frac{1}{2}$	.....	.....	.....
Spices ...	0	0	$\frac{1}{10}$	0	0	$\frac{1}{30}$	0	0	$\frac{1}{10}$	0	0	$\frac{1}{30}$	0	0	$\frac{1}{30}$	.....	.....	.....
Fuel (for cooking) ..	0	1	0	0	0	12	0	1	0	0	0	12	0	1	0	0	0	8
Rice ...	.....	.....	.....	.....	.....	8	0	0	.....	.....	.....	.....	0	0	6	.....	0	0 4*
Milk ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	0	1	0
Sugar ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	0	0	1

* Or sago 2 ch. or arrowroot 2 ch.

SCALE OF DIET FOR GENERAL MENTAL PATIENTS (INDIANS)

Atta	...	12 ch.	(mixed wheat and gram).	Fuel coal	...	5 ch.	
				Firewood	...	20 seers	(to start the furnace).
Dal	...	2	„				
Oil (mustard)	...	$\frac{1}{2}$	„	Spices	...	$\frac{1}{80}$ ch.	
Vegetables	...	3	„				

SCALE OF DIET FOR PATIENTS UNDERGOING TREATMENT IN THE INFIRMARY AND DISPENSARY SECTION OF A MENTAL HOSPITAL

Full Diet

Atta wheat	...	6 ch.		Spices	...	$\frac{1}{80}$ ch.	
Rice	...	4	„	Vegetables	...	3	„
Dal Moong	...	2	„	Firewood	...	15 seers	(to start the furnace).
Ghee	...	$\frac{1}{2}$	„				
Salt	...	$\frac{1}{8}$	„	Fuel coal	...	5 seers.	

Milk Diet

Milk	...	...	1 $\frac{1}{2}$ seers	Fuel coal	...	...	4 ch.
Sugar	...	...	1 ch.				

Extras

Milk	...	...	15 seers	Sugar	...	...	15 ch.
Sago	...	...	1 seer				

All patients get the following alternately in the morning:—

(1) Soaked gram 1 ch. per head, (2) Khichri 1 ch. per head, (3) Parched gram 2 ch. per head.

Hospital cases get sago $\frac{1}{2}$ ch. per head, early in the morning.

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SECTION IV

SURGERY

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ON THE RECOGNITION OF SOME ACUTE ABDOMINAL DISEASES

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If there is one department of medicine with which the practitioner should be more familiar than with any other, it is surely that concerned with the recognition of acute emergencies which require prompt treatment for their relief. In the case of chronic diseases there is always time for meditation, for reference to authority, for consultation with a colleague. In many cases of acute disease instant knowledge is not always essential. In cases of pneumonia, typhoid fever or any of the acute exanthemata, and in many others, it is all to the patients' advantage that the morbid condition should be quickly recognized, and that appropriate treatment should not be delayed. But it cannot be said that the patient's life depends entirely upon the practitioner's power at once to recognize exactly what has happened, and upon his rapid application of the only methods by which catastrophe may be averted.

There are no conditions which call upon the practitioner for skill and prompt action in the same degree as do those acute emergencies which occur in connection with abdominal diseases. Of these much has been written, yet few, if indeed any, writers deal accurately with the question of diagnosis; and the simplicity of the matter seems even now to have received less recognition than it merits.

In the first place it should be made quite clear once again that the acute catastrophes which occur in connection with abdominal diseases are in truth the acute terminations of chronic diseases, and are rarely acute new diseases. Let me quote the experience of the Leeds General Infirmary in cases of gastric and duodenal ulceration: In the years 1910 to 1921 we found that of 61 fatal cases of gastric ulcer, there was one case only in which the ulcer was 'acute'; in the remainder the ulcer was chronic. In the same period there were 117 deaths from perforation of duodenal ulcers; in 12 of these there was an acute ulcer, in 4 of the 12 chronic ulcers also were present, and in each case it was the chronic ulcer which had undergone perforation, the acute ulcer being merely incidental. Our experience is not peculiar. Sherren¹ had a similar experience

He writes: 'Of 218 cases of perforated duodenal ulcer treated at the London Hospital, in 6 only was there no previous history of indigestion. Similar figures were obtained in 248 cases of perforated gastric ulcer. In hæmorrhage due to a chronic ulcer the same applies. As the majority of these patients had had more than one course of medical treatment, several had been having intermittent treatment for ten years and one for thirty-two, we are perfectly justified in considering them failures of that treatment, and if surgery was unable to be employed successfully in these emergencies, the mortality is medical rather than surgical.' Walton² found that of 79 cases of gastric or duodenal ulcer which were fatal, 78 were seen on post-mortem examination to have ulcers of the chronic variety.

In my series only the fatal cases are quoted, because a post-mortem examination of the condition of the stomach or duodenum is more trustworthy as evidence of the state of the ulcer than is the necessarily rapid examination made on the operation table when one's activities are directed not so much to the examination of pathological states as to the recovery of the patient. The œdema so often surrounding an ulcer that has perforated rapidly through visceral walls, is often baffling, and may be ascribed to an acute ulcer rather than to acute exacerbation in a chronic ulcer. The obvious inference to be drawn from these observations is, therefore, that a catastrophic termination of an ulcer is a preventible complication. When, many years ago, I read the first paper on the subject of duodenal ulcer before a medical society in London, a very distinguished physician rebuked me for my omission to include perforation among the symptoms I described. I replied that I would as soon think of doing that as of including a ruptured perinæum among the signs of pregnancy.

In our series of cases of fatal perforation, medical treatment had been administered on one or more occasions in virtually all cases; but as we know the 'medical treatment' followed by many patients is as nearly as possible worthless. The medical treatment of chronic gastric and duodenal ulcers can only hope to be successful under conditions of rest that are denied to the great majority of patients. It is not Medicine that is at fault, nor is it, in many cases—though often enough it is—the patient who falls from virtue; it is the economic conditions which make it difficult for a patient to have adequate rest from his labours, and the grievous lack of accommodation for such patients in hospitals. The acute catastrophes concerned with gastric and duodenal ulcer are then, we may agree, preventible in the vast majority of instances.

When perforation occurs, what symptoms and signs are present? The picture is so characteristic that error is hardly

possible. I have had the opportunity of seeing three patients within five minutes of this terrible catastrophe, and so deep an impression was made upon me that the recollection is a haunting one. For the agony suffered by the patient is almost beyond belief, and is written on every line of a face that speaks of torture. The face is pale, haggard, anxious and appealing, the eyes wide and watchful, the brow and temples bathed in sweat, the hair soaked. The patient struggles for breath in short, panting respirations which are wholly costal, for the diaphragm, being an abdominal muscle, is fixed. Words spoken are jerked out in expiration only; every syllable is part of a deep moan. What strikes every onlooker is that the patient's body is rigid and motionless, no slightest movement dare be attempted. If an endeavour is made to touch the abdomen, the patient's hands are at once lifted in protest and in protection, but the chest and abdomen stay motionless. When examination is made, it is realized at once that the patient is cold; and the temperature will rarely be found more than 95° or 96°F. The abdomen is immobile, and the muscles are taut and rigid: 'hard as a board' it is said, but if there is anything harder it is the abdomen in this time of catastrophe. A further examination of the abdomen will almost always show an area of greater tenderness and if possible of added rigidity over the area involved in stomach or duodenum.

When the pulse is examined a great surprise is felt, for it is not increased in frequency nor diminished in volume, blood pressure is not diminished, and in a few cases that we have examined the blood volume is unchanged. There is therefore no 'shock'. Great harm has come from the almost invariable use of the word 'shock' to describe the conditions. My friend, Mr. Zachary Cope, whose writings are always so helpful, clings to this use of the word 'shock' in spite of remonstrance. The use is really indefensible, and, indeed, dangerous. When a patient is seen whose general and local conditions suggest the occurrence of a catastrophe, and the pulse is found to be normal, the practitioner is betrayed: for he has learnt that among the symptoms of rupture is 'shock'; and shock being absent the diagnosis is impugned or denied. Shock is never a symptom of perforation. It is a symptom of peritonitis, which follows quickly upon leakage from the stomach or duodenum. In the patient's interest, no less than in the service of truth, we must discharge the word 'shock' from its use in this connection.

The period of initial profound prostration varies in different patients and may be ascribed to variations in the size of the perforation, the character of escaping contents—especially in respect of acidity, the general condition of the patient and so forth. Within an hour or two it is followed by a period of re-

action, characterized by an improvement in the appearance of the patient, pallor being replaced by flushing, lines of anxiety being smoothed away, and the body growing warmer. But the pulse steadily rises, the rigid abdomen becomes fuller, and since the diaphragm is being pushed higher, respirations become shallower. For reasons which I gave many years ago, fluids leaking from the stomach tend to trickle down to the right iliac fossa and to overflow into the pelvis. So there may be acute pain or tenderness in the right iliac fossa, and a careless diagnosis of appendicitis may be made. It is in this stage that the 'absence of liver dullness' upon which so high a value has long been placed will be recognized. It is almost valueless. I very rarely percuss the abdomen, and I have been amused to see the liver percussed when it could be felt! At this time, too, vomiting may first be noticed; and from now onwards conditions suffer a fast and progressive deterioration.

It is, however, the earliest stages of perforation for which we should be on the alert. And remembering what has been said, we may conclude that perforation of an ulcer in the stomach or duodenum is almost invariably preceded by the history of a chronic ulcer; and that some exacerbation of symptoms may have been observed in a few preceding days. When perforation occurs the patient is struck motionless: he endures a degree of agony that reaches the very limit of human power to withstand, his face is sweating, he pants and groans on expiration as he tries to speak. His abdomen is inflexibly and unalterably rigid. His pulse is normal. No more need be said. Those signs and symptoms are compulsion enough for any medical man to say that 'Here is a grave abdominal catastrophe that cannot be treated except by surgery,' and to enlist the earliest possible help of the surgeon. It is better to have the good surgeon immediately available than the most expert surgeon a few hours later. As soon as the decision is reached that an operation must be done a large dose of morphine should be given. It helps the patient and lessens the rate of absorption of noxious fluid from the peritoneum.

I have tried to reduce the problem to its simplest terms, for it is only when so expressed that it will be most easily and most surely apprehended and retained for instant service. Other catastrophes may, however, occur which require discrimination.

Acute thoracic diseases may sometimes cause a mimicry of abdominal disease. To discriminate is important, for it is disastrous to give an anæsthetic and remove an appendix, let us say, in an early stage of pneumonia. I have notes of seven cases in which I was asked to operate for an 'acute abdomen' when I diagnosed an 'acute thoracic condition'. What are

the points of difference? First and chiefly the rate of respiration. The normal ratio of pulse to respiration is approximately four to one. If this ratio is reduced to three to one or two to one, then with increasing probability the lesion is above the diaphragm. In thoracic conditions the temperature is almost always raised and may be high, 102° or over. In the early stages of abdominal catastrophe it is lowered, rising only later, and then only slightly. Rigidity of the abdomen is present in thoracic diseases, especially those near the base when the diaphragmatic pleura is involved; but the rigidity is only a stiffness, it is not the obdurate incoercible hardness so characteristic of conditions below the diaphragm. And the lower parts of the abdomen are always definitely slacker than the upper parts.

Acute inflammation of the pancreas is not seldom, indeed, I may say generally, diagnosed as some other less serious form of catastrophe. It is, however, the easiest of all acute diseases to be diagnosed, and this for two reasons. The pain is even more acute than in cases of perforation; it is, indeed, I think, the most horrible agony man is ever called upon to endure; and there is always shock. From the first moment the patient is not only in a condition of profound prostration, but his pulse is rapid, thin and very feeble. There is all the collapse that even a great hæmorrhage would cause and more than the agony of a visceral rupture. Abdominal rigidity is always present, and it is, without exception, in my experience much more obvious in the upper than in the lower part of the body. The only reason which accounts for the frequency of inexact diagnosis of this condition is that it is 'not thought of'. That can be the only explanation, for the signs and symptoms are extremely obvious.

Acute hepatic colic is supposed at times to be with difficulty distinguished from perforation. There should not be the slightest difficulty if for one reason only: In perforation there is immobility; in colic there is restlessness. The agony is severe, the pulse quickened, vomiting may be present, but there are minor evidences. The important feature quickly recognized is that the patient rolls on the floor, twists and turns in bed, gets up and walks, is bent double, presses his hands to the belly, or leans over the back of a chair. There is no rest, nor any release from pain. It is really useless to discuss other differential features, when the clearest discrimination is immediately possible.

There are times when the differential diagnosis of *acute appendicitis* presents difficulties. The first symptom of appendicitis is always pain, and almost always pain referred to the epigastrium; it is only later that it may descend to the right iliac fossa. If pain in a first attack begins in the iliac fossa its cause will rarely be found in the appendix. In all cases the

temperature is raised to an appreciable, but slight, degree. The acute exacerbations of appendicitis are rare apart from treatment. It is true that gangrene of the appendix or intense degrees of inflammation may develop without the provocation of therapeutics, but in all cases the peritonium, with the most competent help of the omentum, is capable of adequate defence, and the most that is likely to happen is a 'phlegmon' on the iliac fossa, or perhaps an abscess. The dramatic developments of appendix infections occur as the result of treatment—the administration of aperients. If aperients were never administered there would be few, if any, deaths from this disease. The majority of cases of appendicitis are obstructive in origin. An aperient, by causing increased secretion in the appendix and excessive action in its musculature, may drive the obstruction away and release the pent-up contents, or it may fail to do so, and gangrene and perforation are then not unlikely. It is 24 years since I first announced to my incredulous colleagues at a meeting of the West Riding Medico-Chirurgical Society that I had never seen perforation not provoked by purgation. I can still say the same: 'Avoid aperients'.

I have tried to put matters very briefly, and to reduce them to their simplest terms. It is, I think, only by doing so that many irrelevancies can be cleared away and many impediments to an instant and accurate diagnosis removed. Mistakes in the diagnosis of an acute abdominal catastrophe should be very rare if the observations I have ventured to make are kept steadily in mind.

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- 2 WALTON, A. J. *Lancet*, 1922, ii, 209.

ANÆSTHESIA

GENERAL ANÆSTHESIA

By BRANFORD MORGAN, M.D., M.R.C.P. (Lond. & Edin.)

SENIOR ANÆSTHETIST, NORFOLK AND NORWICH HOSPITAL, AND
ANÆSTHETIST, JENNY LIND HOSPITAL FOR CHILDREN, NORWICH

In the following short article on General Anæsthesia, a résumé will be given of modern methods, embodying points which have been found to be of practical value in the everyday work of the anæsthetist.

The importance of the preliminary preparation and observation of the patient cannot be too greatly stressed. To the patient it ensures that not only is he in the best physical condition for his ordeal, but it enables the anæsthetist, by a careful routine examination, to give his patient confidence and encouragement, to judge of the operative risk involved, and to decide on the anæsthetic agent best suited to the case.

Except, of course, in cases of emergency, the patient should be in bed twelve hours before the operation.

FEEDING.—For two or three days before operation, it is as well for the diet to contain a larger amount of carbohydrate; in addition, plenty of water should be drunk, and sugar, *e.g.* in the form of barley sugar is useful, especially in children, as a prophylactic against post-operative acidosis. No solid food should be taken for at least four hours before the time of operation, but prior to this, a plentiful diet is allowed.

APERIENTS.—If the patient has been in bed for some days, an aperient may be taken not later than 36 hours before operation. In the case of a patient not confined to bed, whose bowels have acted normally up to the time of admission, no aperient is necessary. Except in rectal cases, no enema should be given on the morning of the operation. The excessive use of purgatives, enemata and starvation have had much to do with post-anæsthetic vomiting, and, by dehydration, make the patient less able to withstand shock.

TEETH.—The teeth should be carefully brushed and mouth-washes employed frequently, to keep the oral cavity free from sepsis and so help to avoid post-operative lung complications.

PRE-OPERATIVE MEDICATION.—Atropine sulphate should be given as a routine, in dose of 1/100 grain hypodermically, 20 minutes prior to operation. The action of atropine in controlling the secretion of mucus from the upper respiratory tract is invaluable, especially during ether anæsthesia. In chil-

dren, when a hypodermic injection may cause alarm, atropine may be given by the mouth (Liq. Atropine sulph. m 1).

Morphia is useful in certain nervous patients, and is necessary when a prolonged gas and oxygen anæsthesia is to be administered. In abdominal operations, the writer is against the use of morphia, as, owing to its depressant action on respiration, it is often impossible to get the patient deeply anæsthetized, and so produce adequate relaxation.

SOME GENERAL CONSIDERATIONS.—Before induction, the patient should be arranged in a thoroughly comfortable posture, and, except for a few words of encouragement, the only instruction necessary is for him to keep the eyelids closed. During the operation, the eyelids should be kept closed by a liberal application of vaseline, and care must be taken that not only no liquid anæsthetic but no pieces of the mask or face pad cause irritation. During and after operation, castor oil should be dropped into the eyes.

It is not too much to say that the chief point in a good anæsthetic is the providing of a perfectly free airway. In the early stages, induction with gradually increasing strength of vapour should be the rule; later, the lower jaw may be kept forward by pressure just above the angle. The use of an artificial airway is a great help in obtaining free respiration, the most useful type being the rubber airway. When induction is with nitrous oxide or ethyl chloride, a small wooden dental prop should be inserted prior to administration of the anæsthetic used.

The use of gag and tongue forceps is to be deprecated, and, with increased experience in obtaining a free airway, these instruments will be needed but seldom.

For quiet induction, absolute quiet is essential on the part of those around the patient. It must be remembered that just prior to loss of consciousness, the auditory faculty is acute, and even a slight noise may change a quiet into a restless patient. Slight movements on the patient's part are not to be curbed, and when any restraint is necessary, as little force as possible should be exerted.

ETHER.—From the practical point of view, the chief characteristics of Ether are its volatility and inflammability. The first has practical bearings on its administration by the open method, whilst the latter makes it dangerous for Ether to be used in the proximity of naked lights. For example, Ether must never be used in proximity to a diathermy apparatus or cautery, nor close to a gas, electric or ordinary fire for heating purposes. Numerous accidents have been described from ex-

plosions as a result of non-observation of these precautions. Ether must be kept in cool storage and dark bottles, and should not be exposed to strong light for long periods. If these precautions are not observed, the Ether deteriorates, with production of impurities consisting of aldehydes and peroxides. These are irritating and toxic bodies, and produce undesirable effects, such as vomiting and, possibly, clonic convulsions during anæsthesia. For this same reason, a sample of the Ether should be periodically tested for these impurities.

Ether is unquestionably the safest and easiest of administration for the routine anæsthetic.

The disadvantages previously urged against it, namely, the respiratory embarrassment from excessive secretion of mucus, and post-operative respiratory complications, and its inclination to cause greater post-operative vomiting, can be avoided by modern methods of preliminary preparation and administration.

INDUCTION.—Induction of anæsthesia by Ether only is not a method of choice, owing to its unpleasant odour and choking effect in doses sufficient to induce anæsthesia. It can, however, be carried out by the Drop Method, especially in patients in a debilitated and weak state or those who are under the influence of hypnotics. The method is to apply to the face a large pad of gamgee, with central hole of sufficient size to leave the nose and mouth uncovered. The mask, with 16 layers of gauze, is then placed on the face piece, and from a drop bottle Ether is dropped on to different parts of the mask, with gradually increasing rapidity. When once the patient has become insensible to the vapour, the concentration of the latter can be increased by covering the mask with a blanket or piece of thin mackintosh, which also causes a certain amount of re-breathing.

Another method of induction by Ether alone is that practised by Rood, in which a mask, covered with many thicknesses of gauze, is saturated with Ether and held at first a few inches away, rapidly covering the face with the mask, again covering the latter with blanket or towels.

The more usual method of induction is by the aid of some other anæsthetic agent, passing on to Ether when the patient is under the influence of the inducing agent.

GAS AND ETHER.—The apparatus necessary for this is a nitrous oxide cylinder, to which, at one end is attached, by a length of tubing, a two-way gas bag with stopcock at its attachment to the cylinder tubing, and the other end fixed to a Clover's Ether Inhaler. With the indicator of the latter set at 0, gas is administered, until the patient can be passed gradually on to Ether.

• **ETHYL CHLORIDE: ETHER.**—Induction by Ethyl Chloride may be carried out by closed or open method. In the former, 3–5 c.c. of Ethyl Chloride is sprayed into the bag attached to a Clover Ether apparatus. Induction is rapid, and with the appearance of stertorous breathing, Ether is given in gradually increasing dose. In the open method, Ethyl Chloride is sprayed on to the usual gauze-covered mask, until the breathing becomes stertorous, when Ether is poured on to the mask, the object being to get the patient under the influence of Ether without respiratory irritation.

The latter method, although useful at all ages, is especially advantageous in children, in that Ethyl Chloride, by the open method, does not produce tonic spasm of the jaw muscles and accompanying cyanosis, such as is occasionally seen in its use in closed apparatus.

CHLOROFORM AND ETHER: ETHER SEQUENCE.—The advantage of the two methods of induction mentioned above is the rapidity of induction of anæsthesia. In practice, it is frequently found that patients dislike the feeling of suffocation which a close-fitting face piece, necessary in the foregoing, produces. In such cases, the use of a mixture of Chloroform and Ether is advisable. The best mixture consists of two parts of Chloroform and three parts of Ether, used on an ordinary gauze-covered ether mask. It must be always remembered that one is using Chloroform which remains in the substance of the mask for some time after the Ether has evaporated, and this mixture, therefore, must be used with this point always in mind. If so, and used in the method to be described, it is a safe and pleasant method of induction.

The mask is held some two inches from the patient's face, and the mixture slowly dropped on to varying parts of the mask, until the respiration becomes slightly stertorous. Ether is then substituted for the mixture, the mask being placed on the face on which a flat face piece, as described above, has been adjusted. As little as possible of the mixture is to be used; and here it may be added that the writer is strongly against the use of mixtures of chloroform and Ether being used, except for induction purposes, owing to the differing volatility of the two substances, and, therefore, the impossibility of gauging the amount of chloroform which the patient is inhaling. In his opinion, mixtures are by far the most dangerous means of anæsthesia.

The patient being now under the influence of Ether, anæsthesia may be continued by various methods, closed or open. Whichever method is chosen, the anæsthesia must be maintained at a deep level with a perfect air-way; the colour should be good, and pupils fully dilated.

Closed method of administration is best carried out by the well-known Clover Apparatus, a description of which is unnecessary in such an article.

The open—or what is really the semi-open—method consists in the application of Ether to a gauze mask of 16 layers thickness. Application is made by continual dropping, at required intervals, of the Ether. The method is easy, but requires a large amount of Ether, and also has the disadvantage of setting more Ether free into the air of the theatre. The blowing of Ether vapour under a mask is the better method. This may be carried out by means of a Wolf's bottle, preferably about the size of a pickle jar, the long tubing passing under the surface of the Ether, whilst to the short exit tube is attached a length of tubing leading under the mask. The vapour is pumped in either by hand or foot bellows, or oxygen may be bubbled through from the usual oxygen cylinder. A most convenient apparatus is one devised by Shipway, which consists in an Ether bottle as described and a Junker bottle for chloroform. By means of a stopcock, Ether, chloroform or mixtures of the vapours are passed through a Thermos flask of hot water, thus warming the anæsthetic vapour.

CHLOROFORM.—From the anæsthetist's standpoint, the characters of chloroform to be remembered are: (1) its irritating qualities, which may result in burning of the skin, if dropped on to the face during administration; (2) its lower volatility than Ether; (3) its depressant effect on the respiratory and cardiac centres; and (4) its liability to cause sudden death, and delayed Chloroform poisoning. In many cases, Chloroform has very definite advantages, although, with the modern administration of Ether, these advantages are not so marked as formerly. Chloroform is more suitable for cases of bronchitis and pulmonary disease, especially in old subjects, and in cases where operation with the diathermy is to be performed.

Some surgeons demand its use in operation for removal of breast, owing to the lessened amount of bleeding; but as this advantage is due to the depressant action on the circulation, it should not be allowed to stand.

It is the writer's opinion that only in the most exceptional cases should Chloroform be used to anæsthetize children, either alone or in mixtures.

METHODS.—Preliminary measures should be carried out as in Ether anæsthesia; the administration of morphia previously is not contra-indicated, and in old people especially is of distinct advantage.

The induction of anæsthesia by chloroform is best carried out by the use of the Schimmelbusch type of mask, covered by a single layer of lint. The mask is held a little distance from the face of the patient, and the liquid is at first slowly dropped on to the mask, then in gradually increasing frequency on to each quadrant of the mask in turn, while at the same time the mask is brought nearer to the face. That the patient is under the influence of the Chloroform vapour is shown by slightly stertorous respiration.

The mask can then be applied directly to the face, resting on a face piece of gauze which has previously been moistened, and the strength of vapour increased until full anæsthesia has been reached. This is shown by a glazed eyeball, slightly dilated pupil, absence of conjunctival reflex and a greatly diminished corneal reflex. Also, there should be no muscular rigidity.

The stage of surgical anæsthesia once reached may be maintained either by continuing the Drop method, so as to produce a vapour of the necessary strength, or by means of pumping vapour under the mask by means of the Junker inhaler. This may be done either by means of a hand bellows, or oxygen may be bubbled through the liquid.

Death during Chloroform anæsthesia, apart from asphyxial causes, occurs from overdosage or suddenly. Overdosage is a gradual process, and the onset of respiratory and circulating failure is progressive. The breathing first becomes depressed, and then suppressed, and shortly afterwards the heart ceases to beat. The signs of overdosage are Cyanosis, followed by an ashy grey tint, when the circulation ceases. The pupils gradually become dilated and fixed. If signs of overdosage are detected before the heart has ceased to beat, remedial measures are efficacious. The head should be lowered, the tongue drawn out and artificial respiration by Sylvester's method commenced. It is claimed that injection of adrenaline, directly into the heart, may also help. If these measures appear to be unavailing, no time should be lost in applying direct cardiac massage.

Sudden death under Chloroform has been shown by Levy to be due to ventricular fibrillation, and this has been shown to occur only in light Chloroform anæsthesia. A light Chloroform anæsthesia is, therefore, to be deprecated, and full surgical anæsthesia should always be the aim, when this anæsthetic is used.

NITROUS OXIDE (GAS).—Nitrous Oxide alone is used for minor operations, such as short dental extractions, opening of abscesses, etc. The most reliable sign of anæsthesia with gas is the onset of snoring respiration. The anæsthesia state can be maintained over an extended period by pushing back the valves to 'air,' every now and then, for one or two breaths.

In dental work, when a longer period of anæsthesia is required than is given by a face mask, the nasal method is of great use. The gas may be given alone by means of some apparatus such as Truby's, or admixed with oxygen with the double bag apparatus of Bellamy Gardiner. The patient is instructed to breathe gently in and out of nose—a slight positive pressure of gas is maintained in the bag and the nose piece applied. If the combined gas and oxygen method is used, the indicator is placed at 3-4 parts of oxygen. If the patient should commence to breathe by the mouth the hand of the administrator may be placed over the mouth, or a mouth-piece with expiratory valve is applied. Nose-breathing is thus established. As soon as the respiration becomes automatic, with slight snoring, the operation may be commenced, and the pressure in the gas bag considerably increased. If cyanosis develops, an increased percentage of oxygen may be given, or in the case of gas alone, a breath of air is allowed.

GAS AND OXYGEN.—The use of gas for prolonged anæsthesia has been greatly extended by the production of apparatus whereby a supply of oxygen is administered mixed with the gas. The best known type of apparatus is that invented by Boyle. It consists of gas and oxygen cylinders connected to a sight feed consisting of perforated metal tubes immersed in a bottle of water. The amount of N_2O and O_2 being administered is known by the number of holes through which the different gases are bubbled. The gases thus mixed are connected up with a bottle containing Ether, and if the latter is necessary, the mixed gases may, by means of a stopcock, be made to pass over the surface of or bubbled through the Ether in varying proportions. They then pass to the usual gas bag, valves and face piece. Further accessories in the way of CO_2 may be added to the apparatus, the latter likewise being passed through a sight feed in the mixing bottle; a bottle containing chloroform or chloroform and ether mixture may also be added to the circuit.

The use of gas and oxygen entails careful pre-operative medication. In the ordinary adult, it is the writer's habit to give a hypodermic injection of morphia, gr. $\frac{1}{4}$, one hour before, and another of morphia, gr. $\frac{1}{8}$, or scopolamine, gr. $\frac{1}{150}$, with atropine, gr. $\frac{1}{100}$, a quarter of an hour before operation.

The rubber face piece is applied on to a gamgee face pad and the valves are set at no valves, gas being bubbled through all the holes, O_2 through 2 or 3 holes. The valve is gradually pushed back until air escapes in sufficient quantity to keep the gases in the bag at a slight positive pressure. If onset of acapnia is indicated by slowing of respiration owing to morphia, as it often does, rebreathing should be instituted so as to increase the amount of CO_2 and thus stimulate respiration. In a long ad-

ministration, a towel may be clipped round the head and face piece, keeping the latter lightly applied to the face and so leaving the administrator's hands free to manipulate the gases.

In some subjects, especially during the induction period, or when a strong stimulus is applied, the addition of Ether, or chloroform and ether, is required. It is the writer's opinion that gas and oxygen is an admirable anæsthetic in certain cases and certain operations, both when given alone or when it enables the amount of Ether to be very greatly reduced. On the other hand, its use in all and every type of case is entirely unjustified, especially when it is evident that Ether or a mixture will have to be an adjuvant throughout the operation. The latter can be administered with much simpler apparatus, and in anæsthetics, the simpler the apparatus in conjunction with the best anæsthetic, the better.

The advantages of gas and oxygen in these suitable cases are: (1) greater freedom from post-anæsthetic vomiting, toxic conditions and other discomforts; (2) rapid return to consciousness; and (3) lessened degree of shock.

The cases in which it is suitable are:—

- (1) Diabetics. Helps in the prevention of post-operative coma.
- (2) Cases of extreme shock or toxæmia or feebleness.
- (3) Long operations, under which strong painful stimuli can be excluded, *i.e.* Hernia, removal of Lipomas, etc.
- (4) In combination with local anæsthesia.
- (5) Intratracheally in Thyroidectomy for exophthalmic goitre.
- (6) Cæsarian section for Albuminaria.

Gas produces anæsthesia as a true anæsthetic, not, as formerly thought, purely by asphyxiation. To secure relaxation, McKesson's secondary saturation method may be used, in which the patient is first deeply anæsthetized by means of N_2O . The colour is then restored by administration of O_2 and anæsthesia continued by use of N_2O and 5 to 10 per cent. of O_2 . Ethylene and acetylene have been used more in America as anæsthetic agents than in this country. Ethylene is considered to be capable of a 15 per cent. greater efficiency than nitrous oxide in non-asphyxial anæsthesia and is warmly recommended by C. R. Allen in patients, the subject of active tuberculosis. It is also used extensively in America for midwifery, whilst Langton Hewer states that its chief advantage is the lack of after-effects.

It is administered in the ordinary sight feed apparatus of gas and oxygen, 15 to 20 per cent. of O_2 being necessary. In too concentrated vapour, the danger lies in its depressant effect on respiration.

USE OF CO_2 IN ANÆSTHESIA.—Much discussion has arisen on the use of CO_2 in anæsthesia since the work of Yandell Hendellson and Haggard. Its chief uses are: (1) to produce quick induction, owing to the increase of respiratory volume; (2) to stimulate respiration in acapnic conditions, such as occur with Ether anæsthesia and in a patient under the influence of morphia; (3) to produce elimination of anæsthetic and so lessen after-effects, by administration at the end of the operation. It should not be used in greater concentration than 5 per cent. The cylinder containing it should be plainly marked, as fatalities have occurred through mistaking it for cylinders of O_2 and N_2O .

INTRA-TRACHEAL ANÆSTHESIA.—The direct insufflation by the trachea, of anæsthetic vapours, is one of the real advances in anæsthesia during latter years. Ether is the vapour commonly used, but chloroform or gas and oxygen may also be administered by this route.

Many apparatus are in use; the one to be described (which has been found to be most useful by the writer) is that used by Mennell. It consists of a reciprocating pump driven by a small universal motor, air being pumped, over the surface of Ether contained in a metal chamber, in required quantities controlled by an indicator. A mercurial manometer shows the pressure at which the air is being blown into the lungs, and a safety blow-off, which can be set to blow off at different pressures, is also attached.

The patient is first anæsthetised deeply, in the ordinary method, and the catheter is passed by means of a direct laryngoscope, the best pattern being that devised by Magill. The head should be in a straight line with the midline of the body, and slightly flexed. No force should be used, and care must be taken not to injure the wall of pharynx. The former may result in injury to teeth, whilst the latter may cause soreness in swallowing, and even septic pneumonia.

The laryngoscope holds up the epiglottis, and the opening of the larynx is then easily seen.

This method of anæsthesia is invaluable in all operations about the head, face and neck, as it enables the anæsthetist to be quite away from the field of operation. It enables intra-thoracic surgery to be carried out with safety, as a positive pressure can be kept up by the current of air blown into the lungs.

It prevents the inspiration of foreign material, owing to the strong return current.

It is also a valuable asset in abdominal operations, especially upper abdominal work, providing, as it does, a perfect air-way, with a much diminished or even practical absence of, abdominal respiratory movements. The writer uses this method in nearly all abdominal work. The apparatus described also acts as a suction pump useful in nasal and cerebral work.

ADMINISTRATION OF ETHER PER RECTUM.—This method is useful under certain conditions, but owing to the uncertain dosage, it is rather a convenient form of inducing, and a help in the maintenance of anaesthesia rather than the only means, and it is often necessary to supplement by inhalation. Its use of course is contra-indicated in the presence of, or in cases with, a past history of rectal or colonic disease, and it must be remembered that respiratory obstruction may occur just as in inhalation anaesthesia.

The following method introduced by Gwathmey has been found most useful. It consists in using a mixture of Ether and olive oil. Castor oil is given the night before and warm water enemata until the rectum is clear the morning of the operation. It is important not to use soap and water, as any soap remaining may emulsify with the ether and neutralize its activity. A 50 to 65 per cent. solution of Ether is recommended for children, a 75 per cent. solution for normal adults, and not more than eight ounces of the 75% solution should be given. The administration is by means of a funnel, to which is attached a tube or soft rubber catheter, about $\frac{1}{4}$ " diameter. The latter is passed up about 6", and the mixture is allowed to run in at the rate of one ounce a minute.

Dosage may be reckoned as an ounce of mixture for every 20 lb. of body weight. Atropine and morphia are given an hour before the operation.

If narcosis is too deep, some of the solution may be let out via the tube, which should be left *in situ* and clamped. If too light, it may be deepened by covering over the patient's face.

After operation, two tubes are passed high up into the colon, and cold water and soap is passed up one and runs out of the other. This is followed by introduction of 2 to 4 ounces of olive oil.

The method is useful in nervous subjects, or young and frightened children, anaesthesia being produced without their knowledge. It is also useful in operations about the larynx, tongue and upper jaw.

BASAL ANÆSTHETICS.—By basal anæsthetics are understood substances which, given in safe doses, produce incomplete anæsthesia; and, which are administered in order to produce narcosis prior to induction of surgical anæsthesia.

The use of such substances spares the patient the terrifying experience of the induction period, for children, for the highly nervous, and for those who have to submit to multiple operations, they are invaluable. In addition they allow a more extended use of the gaseous anæsthetics, nitrous oxide or ethylene, whilst if ether is used a much smaller quantity is necessary. Post-operative vomiting is lessened. The drugs of this nature in common use are Avertin, Paraldehyde, and the various barbiturates, namely Nembutal, Sodium amytal. Per-nocton, Evipan sodium.

Avertin.—Tribromethyl alcohol ($\text{CBr}_3\text{CH}_2\text{OH}$) is a white crystalline powder soluble with difficulty in water, decomposing when heated above 40°C ., or exposed for long periods to light, into dibromacetaldehyde and hydrobromic acid, the former being extremely irritating to the bowel.

Avertin is excreted by the liver and kidneys, and is readily absorbed from the rectum. It is put up by the makers in fluid form, the solution being kept stable by amylenehydrate.

The solution for injection into the rectum is made by adding distilled water at 40°C . The two must be well shaken or avertin is apt to crystallize out. Before use the solution is tested for the presence of hydrobromic acid and dibromacetaldehyde by adding one drop of 1/1,000 Congo red to 5 c.c.m. of the solution, when the colour should remain bright orange red.

The use of avertin which we consider safe is .09 gram per kilogram body weight, although the makers and other workers recommend .1 gram per kilogram body weight.

The appropriate amount of the avertin solution is added to sufficient distilled water at 40°C . to make a $2\frac{1}{2}$ or 3% solution. Calculation of the necessary amount of avertin is rendered easy by a dosage table supplied by the makers.

It is as well to empty the rectum by an enema some hours before administering the avertin solution, which is run into the rectum, fairly slowly, by a large catheter introduced well into the rectum with the patient lying on the side. The injection should be made 20–30 minutes prior to the time fixed for the operation. The inhalation anæsthetic used should be either gas and oxygen or ether. We would emphasize that chloroform should not be used in association with avertin owing to its depressant action on the respiratory centre. Overdosage with

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 avertin causes symptoms of respiratory depression; which should be countered by inhalation of carbon dioxide and oxygen and administration of lobeline.

Paraldehyde—is given per rectum the dosage varying from .3 to 1.2 c.c.m. per kilogram ($\frac{1}{2}$ to 1 fluid drachm per stone), with five times the quantity of normal saline solution; the rectal injection being preceded by a hypodermic injection of morphia and hyoscine, and atropin.

The rectal injection should be given one hour before the time fixed for the operation.

Barbiturates.—The best known of the newer barbiturates are sodium amytal (sodium iso-amyl-ethyl) barbiturate; nembutal [sodium ethyl (1-methyl butyl) barbiturate], Pernocton (butyl-b-bromallyl barbituric acid), and Sodium Evipan (sodium n-methyl-c-c-cyclo phenyl-methyl barbiturate).

Owing to the rapid oxidation of their side-chains the aforementioned barbiturates are of short action, sodium evipan being the most rapidly oxidized has the shortest action.

The drugs are removed from the body by oxidation and detoxication (chiefly in the liver), and eliminated through the kidneys.

Nembutal may be given by the oral and intravenous routes. The former is convenient especially in children but owing to the individualistic reaction the results are not so certain as in the latter. For oral administration nembutal is put up in capsules of $1\frac{1}{2}$ grains. One capsule is given to children up to the age of fourteen years, over which two capsules (3 grains) may be given, three quarters of an hour before operation. One capsule may be given the night before operation if desired. Children may refuse the capsule, if so, the powder may be dissolved in a teaspoonful of syrup or in a strong solution of cane sugar in warm water. Even if hypnosis is not produced the patient is usually sleepy or is lulled into a state free from anxiety or nervousness.

Intravenous injection of nembutal given more reliable results than oral administration, but is not free from the danger of causing acute pulmonary oedema unless the injection is carried out slowly, at a rate not exceeding 1 c.c. per minute.

Nembutal is put up in powder form in ampoules of $7\frac{1}{2}$ grains to which is added sufficient distilled water to make a solution of 10 c.c. The injection is proceeded with until the patient falls asleep.

Pernocton is also given intravenously, at the rate of $\frac{1}{2}$ c.c. per 15 seconds, its effect being similar to nembutal.

It must be clearly borne in mind that the barbiturates have definite toxic properties which may cause respiratory depression, acute pulmonary oedema, and a fall in blood pressure. Here we would again draw attention to the danger of using chloroform as the inhalation anæsthetic following administration of a barbiturate as a basal anæsthetic.

The immediate post-operative nursing is rendered more difficult following their use; some 10% of cases exhibit varying degrees of restlessness which may amount to definite mania; whilst the lengthened recovery period necessitates close attention by a nurse for considerably longer than is required by those who have had no basal anæsthesia.

Respiratory depression should be treated by administration of carbon dioxide and oxygen, a lowered blood pressure by injection of coramine, adrenalin or ephedrine, whilst severe pulmonary oedema or coma should be treated by repeated lumbar or cistern puncture as recently advocated by Wilcox and Purves Stewart.

Unsuitable cases for barbiturates are those suffering from respiratory diseases, *e.g.* bronchitis, empyemata; their use is contra-indicated in cases of thyrotoxicosis which appear to be particularly prone to the toxic effects.

Evipan-sodium owing to its rapid excretion has the advantage that sufficient depth of anæsthesia can be obtained to perform certain short and minor surgical operations without danger of toxic effects.

Evipan-sodium is injected intravenously and is prepared by adding to 1 gram of the powder distilled water to 10 c.c.

By previous administration of a small dose of morphia or omnopon, in the writer's experience, better results have been obtained.

Like the other barbiturates *evipan* is individualistic in its dosage; the injection must be carried out slowly at the rate of 1 c.c. per 45 seconds. The patient is asked to count or is engaged in conversation; the first evidence of sleep is usually a yawn after which an amount equal to that already injected may be given more rapidly.

Anæsthesia usually lasts from ten to fifteen minutes, during which, such procedures as dental extractions, examinations and minor operations may be carried out.

There would seem to be few contra-indications to its use, children tolerate it well; fatalities have been described; it should not be used in the extremely ill or cachectic patient.

During administration muscular jactitations may occur. This complication may be lessened by slightly warming the solution before injection and by previous administration of morphia or omnopon.

ENUCLEATION OF TONSILS BY DISSECTION.—For this operation, deep narcosis is necessary. The patient is anæsthetized to a deep degree in the ordinary way; a sand-bag is then placed beneath the shoulders, allowing the head to rest upon the occiput, thus allowing blood to accumulate in the pharynx, without danger of inspiration into the larynx. The Davies' gag, which combines tongue depressor with gag, gives an ideal exposure for the surgeon and air-way for the anæsthetist. An attachment is carried, whereby Ether can be administered through a Shipway or other similar apparatus, during the operative procedure.

POST-OPERATIVE VOMITING.—Prolonged vomiting after anæsthesia is much less frequent than formerly. The reasons for this are the better preoperative procedures, especially the abandonment of starvation and of active purgation that was formerly the rule. Modern methods of anæsthesia, the use of Ether rather than Chloroform, especially in children, are also reasons. The actual cause of post-operative vomiting is still in doubt. The most recent substance, to be used in the more severe cases of post-operative vomiting, is Insulin, and in the graver cases of the conditions which are associated with acidosis, Insulin is certainly of use. Insulin enables the body to utilize carbohydrate, and so to control the incomplete metabolism of fats, which is the cause of the acidosis and ketonuria, and increase the alkali reserve of the blood. Certain authorities advise the giving of glucose intravenously at a slow rate—five hours being spent in the infusion of 1,000 c.c. of a 10% solution of glucose, Insulin being given hypodermically meanwhile. The first injection of 20 units is given one hour after the administration of glucose has started, and ten units are given one hour later.

Glucose and Insulin have also been used as a routine preventative measure by Potter, glucose being given by the mouth or rectum, and Insulin hypodermically. Careful watch must be kept for symptoms of hypoglycæmia, especially when the administration is by the rectum owing to the uncertainty of the rate of absorption.

ETHER CONVULSIONS.—Attention has recently been drawn to the occurrence of convulsions of epileptiform nature during Ether anæsthesia, which are quite unlike anything previously described. These fits have been ascribed to various causes—among them, Atropine, Anoxæmia and toxic bodies in

the Ether. The first two are certainly not the cause, because the fits have occurred when no atropine has been given and anoxæmia is not a cause but a result of the convulsions.

Some writers, such as Pinson (*B.M.J.*, 1927, 1, p. 956), state that excess of CO_2 in the blood is the cause. On the other hand, Wilson (*Lancet*, 1927, i, p. 1117), after an investigation into cases which had occurred in Manchester, concluded that impurities produced in the Ether, possibly due to the practice of bubbling oxygen or air through the liquid, were the cause, and advised frequent testing of the Ether and the careful storage of the latter. This conclusion cannot, however, be considered proved, and there are probably other factors involved.

USE OF MORPHINE AND SCOPOLAMINE.—Morphia and Scopolamine, while not parallel in the entire range of their action, are so in the fact, that they dull the mentality and produce a tranquil somnolent state. Morphia, however, acting more especially in its influence over pain, while Scopolamine is used entirely for its somnolent effect. The idea of the combination of two such narcotics is based on the contention that the sum of the combined action of two or more narcotics, administered simultaneously, or shortly after each other, produces a more powerful effect than if a total equivalent quantity of either narcotic had been administered alone.

TWILIGHT SLEEP.—Solomons in Tweedy's *Practical Obstetrics*, 6th edition, says we have had a long experience of this method and are not so enthusiastic as in previous publications When used with care, skill and caution, no ill results will follow, but if used without regard to the actual obstetric problem, disasters will follow. In a paper by Freeland and Solomons the results of their investigations over a period of three years are given. They conclude:—

1. That it could be given by the mouth.
2. There is no need to keep the patient in a darkened room, and this is undesirable for observation.
3. No ill effects should follow for mother and child if a rational technique with careful observation is followed.

Should the baby be born 'blue' it should be allowed to recover by itself without active attempts at stimulus.

On the rare occasions it is given at the Rotunda nowadays, the following technique is followed:—

1. First dose when the patient complains of pain.
Morphia, gr. $\frac{1}{4}$. Scopolamine Hydrobromide gr. $\frac{1}{100}$, when the effect begins to wear off.
2. Scopolamine gr. $\frac{1}{200}$.
3. The third and fourth doses are Scopolamine gr. $\frac{1}{300}$ and gr. $\frac{1}{450}$ are given when the pains recur.
4. If labour continues after this, give Morphia gr. $\frac{1}{4}$ with Scopolamine gr. $\frac{1}{300}$.

The amount of Scopolamine necessary varies enormously, it must be regulated by the severity of the pains and the condition of the foetal heart. The patient may become very hysterical and must be carefully watched.

Anæsthetics in Labour may be given:—

1. By the mouth of which one of the best is—

R Amm. Bromide	...	...	gr. 15
Chloral Hydrate.	...	...	gr. 15
Tinct. Opi.	...	..	m 15
2. BY HYPODERMIC INJECTION.—Omnopon is a good substitute for morphia. And 2 per cent. Novocain has been given into the perineum.
3. BY INHALATION.—Chloroform is considered the safest anæsthetic in labour. It must always be kept in the dark, and never used in cases of hæmorrhage or toxæmia.
4. BY RECTUM.—Ether combined with Morphia and Mag. Sulphate intramuscularly.
5. INTRASPINAL.

SPINAL ANÆSTHESIA .

By Spinal Anæsthesia is meant the introduction into the subdural space of an anæsthetic fluid, which acts on the roots of the spinal nerves and rami communicantes, thus blocking nerve conduction in the regions supplied by those nerves. The following are the advantages and disadvantages of this form of Anæsthesia.

ADVANTAGES.—

1. The prevention of post-operative shock, this is probably its greatest point, it is therefore of value in severe operations on the lower extremities such as disarticulation at the hip-joint. But once shock

is present as in severe injury it must not be used on account of the preliminary fall of blood pressure.

2. Muscular relaxation is more complete than in any other form of Anæsthesia and therefore of value in conditions such as volvulus
3. In cases of emergency in remote districts the surgeon can work single-handed without an anæsthetist.
4. Vomiting, straining and venous engorgement are absent.
5. No preoperative starvation is necessary; this is important in old and feeble subjects, and the nervous dread of general anæsthesia is avoided.
6. Where other and general conditions are adverse to General Anæsthesia such as diabetes, thyroid enlargement, respiratory disease and nephritis.

DISADVANTAGES.—

1. The uncertainty of the method:—
 - (a) Successful lumbar puncture may be impossible as in osteo-arthritis of the spine.
 - (b) Intrathecal injection having been successfully performed, in a small percentage of cases analgesia does not result.
 - (c) Duration—the operation being in progress it is found that more time is required than the analgesia will last.
 - (d) Regularity of distribution and probable height of anæsthesia.
2. The patient may be unable to stand the lithotomy or Trendelenburg position without light general anæsthesia.
3. Retention of consciousness.
4. It should not be used in cases of high blood pressure and aortic disease.
5. It must not be used in pyæmia or local skin sepsis for fear of septic meningitis.
6. Injury to the cord, cauda equina or hæmorrhage into the canal, are rare if the proper technique is carried out.
7. The following complications, although rare, may result: Asphyxia the result of too high analgesia, severe and persistent headache, toxæmia, this must

be remembered in dealing with children, persistence of paresis and lasting retention of urine or incontinence of faeces.

SOLUTIONS USED FOR INJECTION ARE:—

- (a) Heavier than Cerebro-Spinal fluid. The most satisfactory is Barker's solution which contains 5% Stovaine solution with 5% Glucose. The dose is 1 to 1.5 c.c. according to the weight of the patient.
- (b) Solutions lighter than Cerebro-Spinal fluid:—
 1. Stovaine 10% in saline or sterile water. Dose 0.5 c.c.
 2. Novocaine 10%. Dose 2 to 3 c.c.
 3. Spinocaine, this contains Novocain and Strychnine. Dose 1 to 3 c.c. It is claimed that larger doses of Novocain can be used and the level of the anaesthesia controlled.
 4. Percaine. While its use is still under trial Howard Jones using a strength of 1 in 1,500 with Ephedrine gr. 1 to 1½, claims for this method that it makes spinal injection safe, reliable and of sufficient length that upper abdominal operations can be performed, and that the height of the anaesthesia can be regulated. The amounts to be injected are for 'low spinals' 6 c.c., tenth Dorsal 10 c.c., seventh to eighth 12 c.c., and second to seventh Dorsal up to 18 c.c.

TECHNIQUE.—

INSTRUMENTS.—A Barker's or ordinary Record syringe. The needles should be Barker's 3.25 ins. in length of stainless steel, with stylets, there should be a very short bevel which facilitates the whole amount of the solution being lodged in the theca. The needles must be fine to avoid leakage of cerebro-spinal fluid which is a possible cause of headache.

POSITION OF THE PATIENT.—This must be carefully considered in regard to the particular solution used. Unless the operation is in the pelvis, or a heavy solution is being used and the patient in good condition, the sitting position should never be used, but the lateral position adopted with the thighs well drawn up on to the abdomen and head fully flexed on to the chest, care being taken that there is no rotation of the spine. Danger is most likely with one of the lighter solutions from respiratory failure, on account of raising the patient's head.

After 15 minutes the anæsthetic is fixed, and any position may be assumed.

LANDSMARKS.—The edge of a sterile towel is held tightly across the spine from the crest of one ilium to the crest of the other, this will cross the spine of the fourth lumbar vertebra, the puncture may be directly above, *i.e.* between the third and fourth lumbar vertebræ.

INJECTION.—The skin having been iodined at least twice, and a novocain injection given along the tract of the needle. The needle is entered in the middle line passed directly forward for $1\frac{1}{2}$ inches, the stylet withdrawn, and the needle pushed on until the dropping of fluid shows that the theca has been entered; this is usually at a depth of $2\frac{1}{2}$ to $2\frac{3}{4}$ ins. The act of puncturing the theca gives a definite sensation. The cannula having been mounted on the syringe is introduced into the needle, and the solution injected, either after a few c.c. of the cerebro-spinal have been allowed to escape, or an admixture made with the solution in the barrel of the syringe. With Percain the solution is immediately run in. No injection should be made with any solution if the flow of fluid is poor.

Signs of Successful Injection:—

- | | |
|--|-------------------------|
| 1. Sensation of warmth and tingling in the feet. | Time one minute. |
| 2. Analgesia of rectum, perineum and penis. | „ four minutes. |
| 3. Paralysis of legs and analgesia to groins. | „ five minutes. |
| 4. Analgesia to or above umbilicus. | „ seven to ten minutes. |

The average duration of analgesia with stovain in adults is 50 minutes, but may be as short as 20, or as long as 90 minutes.

COMBINED METHODS OF ANÆSTHESIA—By this is meant the local use of anæsthesia with a patient in a state of unconsciousness, either from inhalation anæsthesia or from rectal or intravenous injections. It usually refers to local anæsthesia from Novocain with gas and oxygen or light ether, the latter being limited to the production of unconsciousness. The method has some advantages especially in operations on the chest and abdomen.

LOCAL ANÆSTHESIA

Varying degrees of analgesia can be produced by pressure on the nerves of a part, the cutaneous injection of water, cold of which ethyl chloride is the most satisfactory, carbon dioxide may be used but is not so easily handled; and venous conges-

tion by which the limb is first rendered bloodless by an elastic bandage, which is then removed except two or three turns above the area of operation; the part below is rebandaged so that there is a bloodless area between the two constricting bands; into a vein of this area 20 to 60 c.c. of a 1 per cent. solution of Novocain is run. All these methods have definite disadvantages and are not to be recommended except when other means are not available.

THE FOLLOWING ARE THE REQUIREMENTS OF A GOOD LOCAL ANÆSTHETIC:—

- (1) It should be efficient in producing a durable, diffusible, and maximum analgesic effect with a minimum of local tissue disturbance.
- (2) It should be non-toxic to the patient, when absorbed in doses required to obtain the fullest local effect.
- (3) It should be non-irritating and non-toxic in its local action.
- (4) Absolutely sterilizable by heat.
- (5) Soluble.
- (6) Thoroughly compatible with Adrenalin.

LOCAL ANÆSTHESIA CAN BE PRODUCED:

(1) By the application of the drug to the surface to be anesthetized. Cocaine is the drug commonly used and in the following strengths:—

Eye for the removal of foreign bodies 4%.

Nose, throat and larynx 5 to 10%.

Granulating wounds 5 to 10% or Carbolic Acid 5%.

For painful ulcerated surfaces, such as inoperable malignant growths, dusting with Orthoform is very satisfactory.

A special word of warning is necessary as regards the bladder and urethra; here the danger of Cocaine poisoning is great and Novocain should be used.

(2) By infiltration of the operation area; this is very satisfactory in small areas, and combined with regional anesthesia can be used for large areas.

(3) By injection into or round the nerves supplying the part to be operated on, for example into the brachial plexus (regional anesthesia).

(4) By special forms of regional injection—splanchnic, sacral. In splanchnic anesthesia the object is to block all stimuli from

the abdominal viscera, with the injection of the abdominal wall a painless operation is possible. The aim is to place the injection in the loose connective tissue lying behind the peritoneum on the front and sides of the first lumbar vertebra. This can be done either by sight after opening the abdomen (anterior splanchnic or posterior splanchnic), by passing the needle through the muscles of the back. Sacral analgesia is not spinal anæsthesia, it is designed to block the conductivity of the spinal nerves with their sympathetic fibres after they have passed through the dura.

TECHNIQUE OF INJECTION.—

SOLUTIONS.—Two solutions are used—Novocain and Percaine. Cocaine is not now used for infiltration anæsthesia, for although it is four times as powerful an analgesic as Novocaine it is seven times as toxic, and its solutions cannot be boiled. Novocain is soluble in normal saline, can be boiled without change, it is used in strengths of half, one, and two per cent.; the former are used for extensive infiltration and the latter for large nerve trunks. Adrenalin 1 in 200,000 is added after the Novocain solution is boiled in the proportion of 1 c.c. to every 200 c.c.; it is omitted in operations on the toes, fingers and penis for fear of gangrene. Usually 250–300 c.c. of the 2% solution can be used in an adult with safety, the only danger is direct injection into the circulation.

The other solution is Percaine. It is a derivative of quinoline and so related to quinine, but has nothing to do with the Cocaine group. While it is about four times as toxic as Cocaine, it can be used in such very dilute solutions that the toxic effects are negligible, for infiltration up to 400 c.c. of 1 in 2,000, while for nerve blocks up to 150 c.c. of 1 in 1,000. It has the following advantages—its solutions can be boiled repeatedly without decomposition and keep indefinitely, its immediate effect is at least as satisfactory as Novocain, the effect lasts much longer than Novocain from 3 to 6 hours, and it is not followed by hyporæsthesia, it is also available as a surface anæsthetic where Novocain is not satisfactory. About double the amount of Adrenalin should be added 10 m to every oz.

INSTRUMENTS FOR INJECTION.—An ordinary glass Record syringe can be used preferably with the nozzle at the side, and with a bayonet rather than the plug on needle attachment. The needles should be of varying lengths up to 12 c.m. for the posterior splanchnic injection; they should be firm, rigid and very sharp.

METHOD OF PROCEDURE.—First a wheal is made in the skin, through this wheal the larger needle is passed, the

whereal for the next introduction is made by moving the needle subcutaneously to the desired spot, and piercing it from the deep aspect. As the needle point is advanced the solution is slowly forced into the tissues. When the direction of the needle is changed, withdraw the point into the subcutaneous tissues, inject the deeper structures first, never insert the needle right up to the mount, for fear of its breaking at this the commonest point, and then not being able to withdraw the broken end. It is usually better to give all the solution before beginning the operation, but reinforcements can also be made during the course of the operation.

SCOPE OF LOCAL ANÆSTHESIA.—The method is not so much used in England, as in America and on the continent of Europe. The operation takes longer, the patient is conscious, an embarrassment to some surgeons, it is not successful with inflamed tissues, there is somewhat more after-pain, and many patients prefer to be unconscious.

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ANTISEPTICS

A great number of chemical substances either kill or inhibit the growth of micro-organisms, and both preventive medicine and surgery are dependent upon efficient methods of disinfection.

The action of antiseptics are widely divergent, and are both physical and chemical.

PHYSICAL.—

1. Light.—Sunlight and ultra-violet rays, a wavelength of more than $350\text{ m}\mu$ has little or no bactericidal effect, but the disinfectant action increases as the wavelength is decreased.

2. Osmotic Pressure.—As in concentrated solutions of salt and sugar to preserve foods.

CHEMICAL.—

1. By Oxidation.—Such as Boric Acid, Sodium Peroxide, Potassium Permanganate, Hydrogen Peroxide, Halogens—Iodine, Bromine, Chlorine, Eusol and Dakin's solution. Halogen Derivatives—Chloramine T., Dichloramine T.

2. By Chemical Reduction.—Formaldehyde, Sulphur Dioxide in the presence of water.

3. By Metallic Deposition and then Absorption.—Biodide of Mercury, Silver Nitrate.

4. By Chemical Combination with either the nuclear material or with the protoplasm. These antiseptics include dye-stuffs and other cold tar derivatives quinine and the essential oils.

DESTRUCTION OF BACTERIAL SPORES.—These possess amazing powers of resistance, for example, the spores of *Bacillus Tetani* survive for more than ten days in the following solution: Ethyl alcohol (70 per cent.), Phenol 5 per cent., Undiluted Lysol, Acriflavine 1 per cent., and Perchloride of Mercury 0.1 per cent.

They were however killed in a few minutes by Iodine Trichloride 1 per cent. and Hydrogen Peroxide 10 vols. It would appear that the power of chemicals to destroy spores depends entirely on their power of penetration.

ANTISEPTICS MAY BE CLASSIFIED AS INORGANIC OR ORGANIC.—The former group containing the Mercury, Bismuth, Silver and Zinc salts, Hypochlorous Acid and its salts, Iodine, Boric Acid, Chlorine and Hydrogen Peroxide. The latter group, the Phenols, Naphthols, Iodoform, Alcohol,

Urotropine, Formaldehyde, Aromatic Chloramines and the dyes such as Flavine and Brilliant Green.

For practical purposes, the following grouping adopted by Dakin and Durham is the most convenient.

I. ANTISEPTICS OF THE CHLORINE GROUP

(1) HYPOCHLOROUS ACID AND ITS SODIUM SALTS, including Eupad, Eusol and Dakin's Solution, are best suited for cleaning wounds by irrigation. Being unstable and very reactive, they must be frequently renewed in all parts of a wound; this is best achieved by intermittent flushing. They considerably assist in the dissolution of necrosed tissue, and have the great advantage of being very cheap. The skin, being more susceptible than the deeper tissues, should be protected with vaseline.

(2) CHLORAMINE T.—This can be used in stronger solution—up to 2 per cent. it is not toxic—more stable, has more prolonged action, and is less irritating than the Hypochlorites, but has little solvent action on necrosed tissue. It is well suited for use on wounds previously cleaned by Hypochlorites or Dichloramine T.

(3) DICHLORAMINE T.—Dissolved in oily media, it may be sprayed on or poured into deep wounds; it is useful for the first dressing of wounds not requiring irrigation, and for cases requiring prolonged antiseptic treatment. Its action is prolonged, and it can be used in high concentration.

II. ANTISEPTICS OF THE PHENOL GROUP

PHENOL.—While undoubtedly a good disinfectant for many purposes, it does not give such good results in the treatment of badly-infected wounds as many other antiseptics, and in high concentration is most undesirable, being apt to lead to conditions favourable to the growth of anaerobes. Spores are remarkably resistant to Phenol solutions. A mixture of 2·5 to 5 per cent. Phenol solution, with an equal quantity of Hydrogen Peroxide, is favoured by some surgeons.

CRESOLS.—These are more actively germicidal than Phenol, and have been used as a paste made with lanoline and white-wax.

LYSOL.—For general disinfection is very useful, but is not employed for dressing wounds, except in veterinary practice.

CREOLIN (Cyllin).—Used in lotions, strength 1 in 200; as a douche, 1 in 400.

SALICYLIC ACID.—Its disinfecting action alone, in the presence of wound exudates, is not great, and is limited by its low solubility. Borsol, a powdered mixture of Salicylic Acid and Boric Acid, is useful for superficial wounds only.

NAPHTHOLS.—These have antiseptic properties similar to those of the Phenols, but are more useful as intestinal disinfectants or in ointments for skin diseases.

PICRIC ACID.—As a first dressing for burns, it has proved of the greatest value, as it does much to relieve pain and reduce the risk of subsequent infection.

III. ANTISEPTIC SALTS OF THE HEAVY METAL

Those principally used are MERCURY, BISMUTH, SILVER and ZINC; but with the exception of the 'BIP' treatment, which consists of the use of a paste containing Bismuth 3j, Iodoform ʒij, and Liquid Paraffin ʒiij, these antiseptics have not been much used in the War. Their germicidal activity is extremely high, when acting on bacteria suspended in pure water; but when the bacteria are in other media, their powerful action is enormously reduced. Further, with the exception of some colloid preparations, most of the soluble salts of these metals suffer from the disadvantage that they are precipitable by proteins, and the phosphates of wound discharges, so that their high initial antiseptic potency is soon reduced. However, under conditions that do not lead to their rapid precipitation, they are most valuable.

IV. DYES AS ANTISEPTICS

A number of dyes have germicidal properties.

FLAVINE.—This has two forms: the original Acriflavine and Proflavine, which are similar in appearance and in antiseptic properties. It is claimed that they are stable non-toxic compounds, with no deleterious effect on phagocytosis or tissue activity. They are best used as a watery solution 1 in 1,000, gauze being soaked in the solution and kept in close contact with the tissues. Peculiar in that its activity is increased by the addition of serum.

BRILLIANT GREEN.—In a 1 in 1,000 solution, it is harmless to phagocytosis and tissue activity, but it is rapidly rendered inactive by blood-serum, and must, therefore, be frequently renewed in an infected wound; it may replace Dakin's solution in Carrel's method of wound treatment.

MALACHITE GREEN.—A 2 per cent. solution of this substance in 80 per cent. pure Alcohol, if mixed with an equal quantity of a 2 per cent. solution of Mercuric Chloride, also in

80 per cent. Alcohol, is remarkably non-irritating; it is generally applied as a spray for skin disinfection and superficial wounds, but has been of value in septic fractures, burns and osteomyelitis.

MERCUROCHROME-220.—A combination of mercury with the dye fluorescem; it contains 25 per cent. Mercury. Employed in 1 to 2 per cent. aqueous solution for external use.

V. MISCELLANEOUS ANTISEPTICS

IODINE.—Its action is powerful and prompt, when the antiseptic has good access to the micro-organisms.

The method is not effective on a wet operation field, and, therefore, in India, special attention must be given to securing a dry skin, before the Tincture of Iodine is applied. Blistering of the skin often follows the repeated use of Iodine. Three applications are sufficient. One application is made on the previous day when the operation area is prepared, or in emergency cases, at the time the anæsthetic is being commenced; in each case, the operation area is subsequently covered by a sterile towel. The second application is made just before the operation is commenced, and the third, after the completion of the operation, and the skin sutures have been applied.

A 5 per cent. alcoholic solution is generally used; but, for light-complexioned persons, children and old people, and for operations on sensitive skin areas, such as the scrotum or vulva, the strength should not exceed $3\frac{1}{2}$ per cent.

During the War, superficial wounds, after the careful removal of blood-clots and mud, have healed well after the application of 2 per cent. Iodine, in spirit solution, to the wound and surrounding skin.

IODOFORM.—This is now little used in the treatment of wounds, as it only hinders, but does not arrest, the growth of bacteria; it is, however, said to stimulate granulations and relieve pain, and to have a specific action on tubercle bacilli.

Iodoform powder is rapidly absorbed by the skin, and many fatal cases of poisoning have resulted from treating burns with Iodoform. Commercial Iodoform is very much contaminated with bacteria, and should be washed in Carbolic, 1 in 20, before use.

ALCOHOL.—This has marked antiseptic powers, and is one of the best agents for skin sterilization. A 60 or 75 per cent. dilution of Alcohol is more efficacious than the 95 per cent., as the purer Alcohol has much less penetrating power than the dilute.

HYDROGEN PEROXIDE.—It is of great value in treating suppurating foci. Its value lies in the fact that the excessive amount of oxygen which it contains, is held so loosely that it is rapidly given up in the presence of the readily oxidized substances, such as blood and pus. It also has a marked hæmostatic power. On account of its rapid increase in volume, on coming into contact with pus, it must never be used unless there is a free exit. Hydrogen Peroxide has been used during the War, in various dilutions, for irrigation, and for the initial cleaning of a wound, to prevent severe septic infection of an anærobic character. But it is important to remember that its germicidal effect is only transient.

BORIC ACID, BORATES AND PERBORATES.—These have very mild germicidal properties, but, at the same time, have a very extensive use when a bland lotion is required.

POTASSIUM PERMANGANATE.—It is an active germicide under conditions not involving rapid decomposition by excess of organic matter; it is unsuitable for septic wound treatment. It is principally used for irrigation in gonorrhœa.

CHINOSOL.—This has only a slight direct germicidal effect on wounds.

FORMALDEHYDE.—It is used principally for the fumigation of rooms. For the treatment of septic wounds, and the sterilization of instruments and hands, it has not been particularly successful. It is not rapid in action. It is obtained in commerce as a 40 per cent. solution, known as 'Formalin'.

QUINTINE.—Quinine Hydrochloride, 0·1 per cent. aqueous solution, with the addition of 0·1 per cent. Hydrochloric Acid, has been found very effective against the gas bacillus during the War; its germicidal activity is little reduced by pus or serum.

Table of Relative Disinfectant Values (Gardner)

Mercuric Chloride	...	...	...	750
Formic Aldehyde	...	...	...	10
Lysol	...	...	...	10
Carbolic Acid	...	...	.	8
Izal	...	...	...	8
Creolin (Cyllin)	...	...	...	6
Jeyes Fluid	...	...	...	6
Walker's JXL	...	...	...	3
Condy's Fluid	...	...	...	1
Sanitas Fluid	...	...	...	1

Tables of antiseptic values are, however, unsatisfactory, on account of the different resisting powers of different bacteria, and the way in which antiseptic action is modified by circumstances. But, speaking generally, Mercuric Chloride and Silver Nitrate are the most powerful; next, Copper and Zinc salts; then Formaldehyde, Chlorine and Peroxide of Hydrogen; next, Cresols and Carbolic Acid. Salicylic Acid, Boric Acid and Sulphurous Acid are antiseptic rather than germicide. Iodoform acts under special conditions, and Ferrous Sulphate is simply deodorant.

DIRECTION FOR THE PREPARATION OF DAKIN'S SOLUTION

As used for the Carrel-Dakin method of wound treatment.

DAKIN'S (STRONGER) HYPOCHLORITE SOLUTION.—The following is the best method for making large quantities: Rub Chlorinated Lime 150 into a smooth paste with 100 of water and add gradually with stirring Sodium Carbonate 285, previously dissolved in water 900.

Allow to deposit, filter and titrate 20 c.c. of the filtrate with Boric Acid solution (31 gm. per litre) using phenolphthalein suspended in water as an indicator, to ascertain the amount of Boric Acid to be added to the bulk.

An excess is to be avoided, it is best to add slightly less than the calculated amount. The titration must be done fairly rapidly, the amount of Boric Acid to be added is generally about 2% of the volume.

STRENGTH.—This is a concentrated solution containing about 4 per cent. of Sodium Hypochlorite and is to be diluted with 6 parts of water for use. It can be kept for a month without serious decomposition. It should be noted that there is no irritating action from free alkali.

DAKIN'S (WEAKER) HYPOCHLORITE SOLUTION.—To make, rub Chlorinated Lime 200 grammes to a smooth paste with a little water and dilute with water to 5 litres. Dissolve Sodium Carbonate 400 grammes in a further quantity of 5 litres of water and add to the Chlorinated Lime suspension with thorough stirring or shaking.

After half an hour syphon off the clear liquid and filter through cotton wool. Boric Acid 40 grammes is then added to the clear filtrate. The solution must not be kept longer than 7 days. It contains 0.5 per cent. available Chlorine.

DAUFRESNE'S MODIFIED DAKIN'S SOLUTION.—Chlorinated Lime 200 grammes is shaken vigorously with 5 litres of water and left in contact for 6 to 12 hours.

Sodium Carbonate (Dry) 100 grammes and Sodium Bicarbonate 80 grammes are dissolved in a further 5 litres. This solution is poured into the Chlorinated Lime solution, the mixture well shaken and filtered. This solution contains between 0·45 and 0·5 Sodium Hypochlorite.

MILTON'S DISINFECTANT.—This antiseptic contains Sodium Hypochlorite 1·01 per cent. with Sodium Chloride 16·8 per cent. and small quantities of Chlorate, Sulphate and Carbonate and Calcium Chlorite. It is made by electrolyzing Sodium Chloride resulting in the production of a stable form of Hypochlorite with only Sodium as a base.

EUPAD.—Is a mixture of equal weights of finely ground commercial Bleaching Powder or Chloride of Lime and Boric Acid, intimately mixed, and capable of yielding about 21·5 per cent. Hypochlorous Acid.

EUSOL.—Is a watery solution prepared from Eupad, and contains about 0·5 per cent. of free Hypochlorous Acid. It may be employed as a lotion or as a dressing, the gauze being wrung out and applied without waterproof, or as a fomentation or bath.

DENTAL SURGERY

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In the course of medical practice, the physician and the surgeon frequently come across cases which directly or indirectly can be traced to dental disease, or, at least, aggravated by it. It is the object of the writer of this article to classify these and to suggest a means of diagnosis and a method of treatment. It is assumed that a dental surgeon is not easily available, and that the provisional treatment, at any rate, must be undertaken by the doctor himself.

These conditions can be divided into three heads:—

- (1) Conditions purely dental in origin and symptoms.
- (2) Conditions, general in symptoms, of direct or indirect dental origin.
- (3) Conditions of the mouth and teeth, which are caused by general illness or constitutional derangement.

(1) CONDITIONS WHICH ARE PURELY DENTAL

(a) Neuralgia, which may be simply toothache, or referred pain from a tooth.

(b) Swellings in or about the maxilla or mandible, with or without pyrexia.

(c) Fracture of teeth and jaws, due to traumatism.

(a) SIMPLE NEURALGIA OR TOOTHACHE

In simple neuralgia, which is toothache, and is confined definitely to one tooth, the tooth in question will be found to be either carious or tender to touch. The pain is caused either by food or caries irritating a live pulp, or by infection and inflammation of the periodontal membrane caused by a pulp which has died and become septic.

In the first case, the tooth, in general, is not sensitive to touch, and a dressing of oil of cloves or pure carbolic on cotton wool in the cavity, will usually afford relief.

In the second case, the whole tooth will be sensitive, and will seem to the patient to be raised up in its socket, and

actually may not be carious, although it usually contains a large filling. Extraction is the only successful treatment.

In both these cases, pain is frequently referred to other teeth, upper or lower, on the same side of the head. This invariably clears up when the offending tooth is treated or removed.

REFERRED NEURALGIA OF DENTAL ORIGIN.—The cases in which the patient complains of neuralgia in the region running from the jaws to the ear, temple, or in the super-orbital region, are, in nine cases out of ten, dental in origin, and are usually caused by a dental pulp which is degenerating—sometimes under a filling in a tooth already carious, or from an impacted tooth which is pressing on the root of the tooth immediately in front of it. The diagnosis in these cases is much more difficult.

Briefly, the pain from an upper molar is referred to the temple and round the orbit, and, quite frequently, into the teeth in the lower jaw, but not to the ear.

The pain from a lower molar, or premolar, is most frequently referred to the ear, the temple and the teeth of the upper jaw, but rarely to the orbit. Rarely, if ever, is pain referred to the other side of the face.

The pain from the incisor teeth is more local, running along the jaw and to the eye, but rarely to the temple or the ear. With impacted teeth, the pain may not be felt in the teeth at all, being referred *in toto* to the other branches of the facial nerves. These teeth are nearly always the lower or upper third molars.

For diagnosis, the teeth should be tested individually with heat or cold, and any tooth responding unusually should be suspected. Impacted teeth can frequently be detected only by radiographic examination.

As in simple cases of neuralgia, the extraction of the offending tooth, when found, gives instant relief. It is well to remember that it is most unusual for two teeth to be affected in this way at the same time. If, therefore, the patient complains of pain on both sides of the face, causes other than dental should be suspected.

(b) SWELLING IN OR ABOUT THE MOUTH WITH OR WITHOUT PYREXIA

(i) Simple dental alveolar abscesses from teeth, in which the pulp has died, or has been previously devitalized.

(ii) Acute swelling, not in contact with the teeth—

(a) At the angle of the mandible extending down the neck with more or less trismus, caused by an impacted wisdom tooth.

(b) Submaxillary cellulitis from any abscessed lower tooth.

(iii) Cysts of dental origin.

(iv) Tumours, benign or malignant.

(i) SIMPLE DENTAL ALVEOLAR ABSCESSSES.—The patient will give a history of intense and increasing pain in one or more teeth, followed, in a few days, by a swelling, and an abatement of the pain. The glands will be affected, the tongue furred, and a slight rise of temperature may be noted. The patient usually feels ill and is constipated. Salivation is increased. A largely filled, or badly decayed, tooth is noted, which is tender to touch or tap. On extraction, pus is usually evacuated, and the condition clears up in a few days.

In severe cases, which have been some time without treatment, the swelling, particularly if arising from teeth in the lower jaw, may point externally and either burst or require opening there, leaving a discharging sinus which will not clear up until the tooth is extracted. (*In all cases of simple alveolar abscess, fomentation on the outside of the face should be avoided.*)

(ii) If the swelling is caused by an *impacted tooth*, usually a lower wisdom tooth, the history is longer, or the history of previous attacks of lesser severity is usually obtained. The swelling extends the neck, and more or less trismus occurs through the infiltration of the masseter. Pus can usually, but not always, be seen welling up from behind the last visible molar tooth. The severity of these attacks varies greatly, and may even terminate fatally.

If possible, the wisdom tooth should be extracted, but if this is not practicable, the tooth in front should be removed and the condition will usually resolve. In any case, the loss of the second molar will facilitate the removal of the impacted wisdom tooth.

An upper wisdom tooth rarely causes swelling through being impacted, although it may cause considerable neuralgia, through pressure on the roots of the second upper molar.

A swelling sometimes may be seen on the actual palate, situated usually about one inch back from the incisors near the middle line or even in the soft palate. There is a short history of very intense pain, which may not be definitely felt in one tooth.

Although this swelling may arise from the palatal root of molar, it almost always arises from a lateral tooth which is dead and septic. It may be necessary in addition to the extraction of the tooth, to open the palate freely in order to drain the abscess.

(iii) The third form of swellings found in the jaws are those which are *cystic* in nature, arising from the root or roots of teeth, or those arising from an unerupted tooth.

In either of these cases, the history is one of very slow growth, six months or more, with complete absence of pain. The swelling which is formed inside the external plate of the alveolus, extends this plate, and thins it, so that in many cases typical 'egg-shell crackling' can be felt on palpation.

These cysts may occur anywhere in the jaws, and may grow to a very large size, pushing back the inner wall of the antrum in the maxilla, or absorbing the body of the mandible, until it is dangerously thin.

If possible, these cysts should be dissected out whole, with the lining intact. Where this is not possible, they should be opened freely and scraped, and the cystic lining finally destroyed by the application of pure carbolic.

The packing of these cysts is, in the writer's opinion, not usually advisable, particularly if the cystic wall has been completely removed. The cavity should be irrigated with weak antiseptic daily. Healing is usually slow, but uninterrupted. If the cyst be found to involve the antrum, free drainage should be insured, until no further discharge occurs.

(iv) TUMOURS, BENIGN AND MALIGNANT.—The various tumours occurring in the mouth, either benign or malignant, hardly come under the heading of dental surgery, and need not be discussed here.

(c) FRACTURE OF THE TEETH AND JAWS

The diagnosis of fractures of the mandible and maxilla is, as a rule, not difficult.

The mandible usually fractures either at the canine fossa or at the angle just behind, or sometimes through the socket of the lower wisdom tooth. Fractures in the jaws are nearly always compound, and movement of the two fragments can be always felt. This movement and the disarrangement of the alignment of the teeth are a sure guide to diagnosis.

The immediate treatment is to reduce the fracture, as far as possible, and, by means of a four-tailed bandage and a stiff chin pad, to render the lower jaw immobile against the upper teeth.

As soon as possible, a metal splint should be constructed and cemented over the teeth inside the mouth. The mouth should be irrigated, from time to time, with hydrogen peroxide, as these conditions frequently become septic. The splints need not be cemented if reasonable stability can be obtained.

When the patient is edentulous and is wearing artificial teeth, should these plates be uninjured, they can be used as a temporary splint with a four-tailed bandage.

Fragments of broken teeth at the site of the fracture should always be removed, but any teeth which can be left, should be allowed to remain, as they can be used as anchorages for the metal splint.

The diagnosis of fractures of the angle is more difficult without radiographic examination. Difficulty of opening and closing the jaws, swelling at the angle, and manipulation are the only means of diagnosis. These fractures are frequently not compound.

In these cases, a four-tailed bandage, used as in the previous cases, should be applied, and should there be much displacement of the ascending ramus, surgical wiring of the fragment is the only successful treatment, but should only be resorted to if other treatments fail.

Fracture in the superior maxilla is a less frequent occurrence, and is nearly always limited to the alveolar bone and its accompanying teeth. The teeth, with the fractured portion, should be pressed back into place, and held in position by some kind of splint.

All these cases of fracture should be referred to a dental surgeon, as soon as possible; for, the sooner an efficient dental splint is fixed, the greater is the chance of successful union.

(2) GENERAL CONDITIONS IN SYMPTOMS OF DIRECT OR INDIRECT DENTAL ORIGIN

The various general diseases which have been attributed to sepsis in the mouth, from time to time, are so great in number that it is hardly possible to refer to them all in this short article. Briefly, in any complaint which may have, as its cause or aggravating cause, infection of streptococcal origin,

the condition of the teeth or gums should be ascertained. This condition can be of two kinds:—

- (i) Sepsis, with or without discharge of pus, occurring round the necks of the teeth at the gum margin..
- (ii) Infection at the apices of the teeth, caused by dead pulps, or infected root filling.

(i) SEPSIS ROUND THE TEETH IN THE REGION OF THE GINGIVAL MARGIN can be of two kinds: acute and chronic.

In the acute stage, the gums become very red and swollen, sometimes almost covering the teeth. There is a discharge, usually not great in quantity, of very foul-smelling matter. The breath is very offensive, and the inflammation may spread to the palate and the fauces.

With this condition the patient feels ill, with general intestinal upset. A rise of temperature may or may not be present.

This condition, which is known as VINCENT'S ANGINA, is characterized, bacteriologically, by the presence of spirochetes in the discharge, and is very contagious, being carried from one patient to another by means of drinking vessels or personal contact. A vigorous antiseptic treatment, with thorough cleansing of the teeth, using hydrogen peroxide generally, and a dilute solution of silver nitrate in the pockets round the teeth, usually produces rapid relief in the acute stage. The chronic stage may persist for some time, and the patient is always liable to a recurrence of the acute condition.

Great care should be taken with the use of tooth brushes, which should be sterilized by boiling daily, as fresh infection can easily be carried from one part of the mouth to another.

In the chronic condition of gum infection, usually termed PYORRHOEA, the gums, though frequently slightly swollen at the necks of the teeth, are not always inflamed, and a definite discharge of pus can be detected at the gingival margin, especially on pressure. The gums frequently have receded, and the teeth appear to be loose in their sockets. X-ray examination shows that the alveolar bone has been absorbed between the teeth, forming deep pockets in which the pus is formed.

Streptococcal infection of the gums may be present without pus or swelling, but a radiographic examination will show that the alveolus is absorbed in a greater or less degree.

Although a patient may have this condition, and may, for many years, be perfectly well, the infection may, at any time,

give rise to general ill health. General debility, anæmia, indigestion and chronic constipation, and many diseases of rheumatic origin, such as sciatica, arthritis and fibrositis can be caused or aggravated by this condition.

Although the condition of the mouth may be improved by cleansing and mouth-wash, it is advisable, whenever possible, to remove all infected teeth; even those which are suspicious should not be retained, as, when once the infection has caused general symptoms, a very slight residue is sufficient to prevent these symptoms from clearing up.

Even after extraction of all septic teeth, some residue of the infection may remain in the intestines and the joints, and need medical treatment before clearing up.

(ii) The second condition, that is, the APICAL INFECTION, is much more difficult to diagnose, as there may be no visible symptoms of any trouble. It is, however, unusual for this condition to be present in teeth which are perfectly sound and free from decay, or in those which have only small fillings. Although the patient will assure you that all his teeth are free from trouble or special sensation, on tapping each tooth, one by one, a distinct difference is usually felt by him in those teeth which are not healthy.

An X-ray examination, using small films inside the mouth, will always show up the trouble. Frequently, a sinus can be seen opening into the gum above the suspected tooth.

In teeth which are affected in this way, the sepsis, and the products of the sepsis shut up in the alveolus, are absorbed by the blood stream, and are thus carried to all parts of the body.

Iritis, arthritis, nerve deafness, and many other diseases may follow, should the resistance of the patient become sufficiently low. The only course is to extract these teeth which are affected.

It is difficult, in the light of our present knowledge, to differentiate between the pathological condition caused by OPEN SEPSIS, such as pyorrhœa, and what I would call CLOSED SEPSIS, such as apical infection; but there seems to me no doubt that sepsis which is occluded, and, to a certain extent, forced into the blood stream, is more harmful than that which, having free drainage into the mouth, is neutralized by the digestive juices of stomach. In time, however, the antiseptic powers of these juices being weakened, the bacteria pass on into the intestines and form fresh focus of infection there.

(3) CONDITIONS OF THE MOUTH OR TEETH CAUSED BY GENERAL ILLNESS OR CONSTITUTIONAL DERANGEMENT

Certain illnesses or pathological conditions may cause direct trouble in the mouth. These are:—

- (i) Measles, scarlet fever, small-pox, and diabetes.
- (ii) Phosphorus poisoning, mercury poisoning; lead and arsenic poisoning will also directly affect the jaws and teeth.

(i) DISEASE IN THE JAWS AND TEETH, FOLLOWING MEASLES, SCARLET FEVER AND SMALL-POX, is rare, and almost always confined to children. The cases are very similar. From four to six weeks after the commencement of the diseases, the gum is seen to be separating from the teeth, until a large portion of the alveolus is involved. Ulceration follows, and the whole of the alveolar border, with temporary and permanent teeth, may be exfoliated. The necrosis never involves the body of the jaw.

The mouth should be kept very clean, with as little interference as possible, and when any sequestrum is definitely loose, it should be removed. The patient's health should in all cases be carefully looked after.

(a) Phosphorus necrosis may occur in factories where the workers are handling phosphorus. The poison is said to enter the alveolus *via* a decayed and septic tooth. Acute inflammation of the periodontal membrane, together with necrosis of the alveolus, follows. Cleansing of the mouth with antiseptics is the only local treatment. Surgical interference should be avoided.

(b) Continual absorption, accidental or otherwise, of mercury salts will cause inflammation and puffiness of the gums and loosening of the teeth—a condition very similar to that described in Vincent's Angina. The history of the case is sufficient to determine diagnosis.

The treatment is the removal of the cause, and the antiseptic and astringent mouth-wash.

(c) In cases of general lead poisoning, a typical blue line is seen round the necks of the teeth, just under the gum margin. The teeth may become slightly loose, but the local irritation is usually very slight, and clears up with general treatment.

(d) Cases of arsenical necrosis in the mouth occur directly from a dressing of arsenious oxide, which has been used to devitalize a dental pulp, and which has leaked into the gum

margin, sloughing it away and then attacking the alveolar bone. The necrosis may be severe, and large portions of the alveolus may come away. If the condition be acute, the tooth in question should be extracted, and the socket and surrounding tissue frequently flushed with a mild antiseptic. The necrosed alveolus should be allowed to come away by itself.

The following suggestions as to MOUTH-WASHES may be useful:—

<i>For General Sepsis with Pus</i>		<i>For Pain following Extraction</i>	
R Hydrogen Peroxide	12 vols.	Carbolic and Hydrogen Peroxide	
To be used with three parts of warm water.		alternately, or	
<i>For Inflammation without Pus (Astringent)</i>		R Acidi Carbolic Glacial	3i
		Liq. Pot.	3i
		Aque ad.	3viij
R Potassi Chloratis	3ij	Use as mouth lotion.	
Pulveris Aluminis	3ij	<i>For Irrigating Cysts which are Non-septic</i>	
Aque ad.	3x	R Glyco-thymoline.	

THE EXTRACTION OF THE TEETH, WITH NOTES ON THE USE AND CONTRA-INDICATION OF LOCAL ANÆSTHESIA

The general method of extraction is well known, but a few suggestions, in regard to the removal of individual teeth, may be of use to medical men who may be compelled to carry out a task which they invariably dislike. Upper molars are best extracted by bending outwards, especially the upper third molars, the external alveolar plate being always much thinner than the internal, which is, in fact, the harder bony structure of the palate. Upper molars having two roots, or one root very much flattened, should be removed in the same way. With upper canines, laterals and centrals, the roots are single, and more or less conical, and can, therefore, be rotated in a more or less degree, and then extracted outwards.

In the lower jaw, the third molar is best removed by means of a straight elevator, inserted below the alveolar margin in front of the tooth, and so used as to lift the crown upwards and backwards. Forceps should not, as a rule, be used until the tooth is lifted almost out of its socket, as the alveolar ridge is much thickened in this region. First and second lower molars can often be pressed inwards, as well as outwards, to loosen them, and no attempt at rotation should be made.

Lower premolars have nearly always conical roots, and should be rotated, and the same applies, in a lesser degree, to lower canines. The lower incisors rarely present much diffi-

culty, as the external alveolar plate is usually thin; but owing to the flatness of the root, rotation should not be attempted.

In all cases of extraction, the operator should force his instrument as far as possible up, or down, between the alveolus and the tooth, and should, by persuasion, loosen it in its socket, before attempting the actual removal.

The above remarks can only be taken as a guide, as variation in the condition of the alveolus and the shape of the roots of the teeth is frequently found different in different individuals.

The use of local anæsthesia in dental surgery is very great. There are many different drugs which can be used for this purpose. Cocaine, with or without adrenalin, novocain, and eucain, are the best known and most widely used. Many preparations are in the market, containing these substances, mixed with small amounts of antiseptics.

Cocaine is used in a 1% solution, a tablet containing $\frac{1}{4}$ of a grain being dissolved in 40 minims of distilled water. The advantage of this drug is its rapidity and certainty of action, an injection of 20 minims being sufficient for any one case.

Its danger lies in the fact that cocaine is definitely toxic to a small percentage of people, and fatal results have resulted from its use. Mixed with adrenalin, which acts as a vaso-constrictor, it is more localized in action, and, therefore, less dangerous.

Eucain, used in a 2 per cent. solution, is much safer than cocaine, but much slower in action, and, in the writer's opinion, much less efficient.

Novocain, in a 2 per cent. solution with .005 per cent. of adrenalin, is by far the best local anæsthetic for general use. Its action is slower than cocaine, but the solution can be boiled without decomposition. Novocain can produce toxic effects, but these are rare and transitory, except in very rare cases. The usual symptoms are acceleration of the heart beat, with a feeling of faintness; this symptom passes in one to five minutes, and is probably caused by the adrenalin in the mixture.

In rare cases, the pulse rate is very much lowered, and true toxic effects are noted, similar to cocaine poisoning, but the percentage of these cases is very small.

In all cases of upper teeth, the injection should be made at the reflection of the mucous membrane on the buccal side, and the needle should be inserted so as to touch the periosteum at about the apex of the root of the teeth.

On the palatal side, a similar injection should be made. After waiting about five minutes the anæsthesia should be complete.

In the lower molar region, the injection is best made in the gum tissue nearer the neck of the tooth, both lingually and buccally, the anæsthetic being frequently introduced under considerable pressure.

The technique for the lower premolars and incisors is similar to the upper teeth. If there is acute inflammation, with or without pus round the teeth to be extracted, local anæsthesia is *contra-indicated*, as there is always a danger of acute local sepsis or even general septicæmia occurring.

REFERENCE

COLLIER : Dental Surgery and Pathology, 6th Ed., 1931.

DISEASES OF THE EAR

By N. S. CARRUTHERS, F.R.C.S. (Edin.), D.L.O.

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The methods of applying medications to the ear are given below.

INSTILLATION

This is carried out by inclining the patient's head towards the healthy ear. The auricle of the ear to be treated is pulled slightly upwards and backwards to enlarge the meatus, and a few drops of the warmed liquid allowed to run in from a dropper. The auricle is permitted to resume its normal position, and then opened again, which helps the fluid to penetrate to the drum.

INSUFFLATION

This consists of blowing the drug, in the form of a powder, into the meatus, with a specially constructed insufflator.

DIRECT APPLICATION

This is carried out with the aid of a probe, on the end of which is firmly twisted a piece of cotton wool, soaked in the prescribed drug. It is the method of choice for all applications of a caustic to the drum and middle ear, and, for its efficient execution, a good light and an aural speculum are essential.

INSPISSATED CERUMEN

The best solvent is heat, really Hot Water at a temperature of 100° to 115°F. (Soda or Boric Acid may be added to the water.)

If the plug is very hard, instil a few drops of—

℞ Liq. Hydrogen Peroxide,

and leave them in for 15 minutes before syringing.

If this fails, use—

℞ Sod. Bicarb.	...	...	...	gr. 30
Glycerine	...	...	...	3i
Aqua ad.	...	...	...	3i

is to be instilled, night and morning, for 3 or 4 days, after which it can be syringed out with an all-metal or a Higginson's Syringe. A glass one is useless.

INFLAMMATION OF THE MEATUS (FURUNCULOSIS)

It is a painful affliction. Either of the following can be relied upon to relieve the pain, and should be used frequently:—

R Carbolic Acid	gr. 6	R Anesthesin	gr. 15
Morph. Hydrochlor	gr. 3	Alcohol Absolute	3iss
Glycerine	ʒi	Liq. Alum. Acetatis	m 30
		Glycerine	ʒi

The solution is warmed, and applied by a sterile stripe of Gauze saturated in it and inserted loosely in the meatus. It should be changed 3 to 5 times a day.

A hot fomentation to the external ear is comforting, and, if the pain is very severe, a hypnotic may have to be given, to secure sleep. When it is necessary to incise a furuncle, it should be done under a general anæsthetic, by transfixing the base with a thin scalpel and cutting towards the lumen of the meatus.

Furunculosis is liable to recur, but can sometimes be avoided by the frequent instillation of Biniodide of Mercury in Absolute Alcohol (1 in 2,000).

ECZEMA OF THE MEATUS

It is usually secondary to Suppurative Otitis Media, which must be treated on the usual lines.

When a primary disease, use either of the following:—

Lotion		Ointment	
R Calamine	gr. 80	R Plumbi Subacetatis	gr. 2
Oxide of Zinc	gr. 20	Ung. Zinci	ʒii
Glycerine	ʒss	Ung. Hydrarg. Subchlor	ʒi
Water ad.	ʒi	Ung. Hydrarg. Nit.	gr. 20
		Adeps. ad.	ʒi

During the acute stage.

Either may be applied by packing the Auditory Canal with gauze soaked in it.

During the *chronic* stage, either of the following may be tried:—

R Oil of Cade	...	...	...	ʒi
Olive Oil	...	...	...	ʒiii

Applied to the canal on a cotton tipped probe.

Or, weekly application of Argentum Nitras 10% may help.

ACUTE OTITIS MEDIA

In the *early* stages, instil a few drops of:—

R Cocaine	...	...	...	gr. 2
Morphia	...	...	...	gr. 1
Carbolic Acid	...	...	...	gr. 3
Sweet Almond Oil	...	...	...	ʒi

and confine the patient to bed, in a warm room.

If the Tympanic Membrane shows signs of bulging, it must be incised. This is best done under a general anæsthetic, preferably Nitrous Oxide or Ethyl Chloride; but if a local anæsthetic is preferred, it can be secured by packing small pellets of wool, soaked in Blegvad's Drops, against the drum-head for 20 minutes. The prescription is:—

R Cocainæ Hydrochloridi	...	...	...	ʒi
Acid Salicylici	...	...	...	ʒi
Spirit Rectificati	...	...	...	ʒii

A timely paracentesis frequently aborts a mastoiditis and should not be delayed.

When discharge is established, it should be encouraged by keeping the patient lying on the affected side and by gently syringing with a Sterile Solution of Sod. Bicarb. (ʒii to the pint of water), or by instilling Hydrogen Peroxide 10 vols.

Attention must also be paid to the primary focus of infection, which will probably be found in the naso-pharynx.

CHRONIC OTITIS MEDIA

A careful search must be made of the throat and nose, for a focus from which the ear is being re-infected, and tonsils and adenoids removed, if present. Assuming that every possible source of infection has been removed, treat the middle ear.

Any granulations must be removed by cauterizing with either of the following:—

Acid Chromic, fused on a silver probe.

Argent. Nitras, 100%, applied on a cotton tipped probe.

The most important item in the treatment is cleanliness; and as the patient is likely to overlook this, and rely on the efficiency of 'some drops,' which are quite useless unless the inspissated pus is previously removed, it is as well to give the patient written instruction as follows:—

- (1) Put 5 to 10 drops of Hydrogen Peroxide in the ear and wait 5 minutes.

- (2) Syringe the ear with warm water.
- (3) Dry the ear out *thoroughly* with wool firmly twisted on the wooden end of a match.
- (4) Put in 5 drops of those prescribed and leave them in.
- (5) Wear cotton wool in the ear.

All 'drops' should be warmed by standing the bottles in a basin of warm water.

Prescribe one of the following:—

R Sp. Vini. Rect. 25 to 50%	R Lot. Flavin.	1 in 1,000	
R Lot. Mercurio-Chrome	... ..	1 in 2,000	
R Zinc Sulphate	gr. 4	R Ac. Boric	gr. 30
Alcohol	℥ss	Sp. Vini. Rect.	℥ii
Hydrogen Peroxide	℥ss	Glycerine ad.	℥i

The conscientious use of these should result in a cessation of discharge.

Should the perforation be large, Ionization may prove useful (see ELECTROTHERAPY, *supra*) or, either of the following powders may be insufflated into the middle ear:—

R Pulv. Iodoform.	℥i	R Dermatol	℥i
Pulv. Acidi Borici.	℥iii	Pulv. Acidi Borici.	℥iii

If, in spite of thorough treatment on these lines, the discharge persists, some form of mastoid operation will have to be considered—either a 'conservative' or a 'radical' mastoid operation—and generally speaking, the former should be given a trial before condemning the patient to a 'radical' operation.

Ossicectomy, in selected cases, gives good results, but is an operation requiring special skill.

DEAFNESS

This may be roughly divided into—

- (1) The Middle Ear Deafness; or
- (2) The Internal Ear Deafness.

In all cases, no matter from what cause, it is of prime importance to keep the general health at its best. To this end the patient must be instructed in simple hygiene and any excess in consumption of alcohol or tobacco rectified. On no account should a deaf person work amongst machinery or in

a noise. Arduous work or over-exertion should be avoided. Frequent holidays should be taken and a periodic tonic of—

Ac. Phos. Dil.	...	...	...	℥ 15
Tr. Nuc. Vom.	...	...	...	℥ 10
Aq. Chloroform ad.	...	...	...	℥ i

is most beneficial. All deaf people are more deaf when tired or 'run down'.

The treatment of the deafness itself consists of removing any septic focus, or correcting any abnormality, such as a septal spur, found in the nose or naso-pharynx. Under this heading is included stenosis of the Eustachian Tube, which is best corrected by catheterization, and in obstinate cases, it may be necessary to pass a bougie.

Internal ear deafness is usually toxic in origin; frequently, the large intestine is the source, and must be treated by the daily administration of a purgative, preferably Ol. Paraffin Liq. Other toxic causes are syphilis, typhoid, malaria and scarlet fever.

OTOSCLEROSIS

This is a distressing form of deafness in which tinnitus is a prominent symptom, chiefly affecting the female sex. It usually starts in the second or third decade and is made worse by any serious illness or by child birth. General ill-health must be corrected, as far as possible, and anæmia, which is a common concomitant, treated.

For the TINNITUS try one of the following:—

℞ Potassii Bromidi	ʒii to ʒi	℞ Acidi Hydrobromici Diluti	
Spirit Ammonia Aromatici	ʒiv		ʒvi to ʒxii
Aq. Camphoræ ad.	ʒvi	Aq. Chloroformi ad.	ʒvi
A tablespoonful to be taken, largely		A dessertspoonful to a tablespoonful,	
diluted with water as ordered.		taken thrice daily after meals,	
		freely diluted with water.	

℞ Hydrargyri Perchloridi	...	...	gr. 1/60
Sacchari Lactis	...	...	gr. 1
Excipientis q.s. ad.	...	...	gr. 8

Ft. pil., mitte tales 60.

One pill night and morning for a month.

When tinnitus is *accompanied by vertigo*, as in Ménière's Disease, try either of the following:—

℞ Acidi Hydrobromici Diluti	...	...	ʒiii
Quinina Sulphatis	...	...	gr. 6
Spirit Chloroformi	...	...	ʒi
Aquam ad.	...	...	ʒvi

A dessertspoonful to a tablespoonful, thrice daily, after meals.

or,

R. Potassii Iodidi	...	..	...	5l
Potassii Bromidi			...	5ll
Tr. Jaborandi	...	...	...	3iii
Syr. Glycerophosphatum		...	...	3iii
Aq. Aurantii Flor. ad.		...	...	3vi

Two tablespoonfuls three times daily.

ARTIFICIAL AIDS TO HEARING

These are of two types: Mechanical and Electrical. Generally speaking, the mechanical, which is merely an apparatus that collects the waves of sound, is most useful in cases of slight or mild deafness affecting the middle ear. The electrical is the better for the more severe cases of deafness, and especially for cases of internal ear deafness, but, on the whole, they are unsatisfactory, and patients are prone to discard them after a short time.

Advanced cases should be advised to study and practise 'lip reading'; but if they are unable to acquire the habit there is nothing left for them but the use of the long speaking trumpet. Unfortunately the deaf are very sensitive about their infirmity and dislike using anything so conspicuous; but there is no doubt that the little hearing they have left, will deteriorate unless the higher auditory centres are exercised by the occasional reception of sound.

DISEASES OF THE EYE

By **LIEUT.-COL. HENRY SMITH, C.I.E., I.M.S. (Retired)**

LATE CIVIL SURGEON OF JULLUNDUR AND AMRITSAR

I shall deal with treatment of the commonest diseases met with at an outdoor Indian dispensary.

CATARACT

In the developed stage, every member of the profession recognizes this condition. In the half-ripe stage, the patient merely complains of progressive failing of vision, and the naked eye can detect that there is a cataract. In the earlier stage, though it is not evident to the naked eye and not evident even to the inexperienced with the ophthalmoscope, yet the patient complains of progressive loss of vision (These cases are never accompanied by pain unless there is the major condition of glaucoma present). He will often tell you in annas in the rupee exactly how much vision he has lost. This you can ascertain with a List Dot Card. If he can read 12-metre type at six, seven, eight or nine metres, he is curable without operation. I have seen cases recover that could only read 18-metre type at six metres. Below this, my experience is that if we recover some vision, it rapidly fails again. Treatment for this early stage is a subconjunctival injection of 1 in 5,000 cyanide of mercury, about 20 minims, will induce an intense hyperæmia lasting ten days. By the end of a month, the patient will generally have recovered completely, and in my observation, this vision endures.

A milder method is to place, under the upper lid every night, some yellow oxide of mercury ointment 4 or 5 gr. to the ounce and massage it through the lid for a minute or so. The result is the induction of a mild hyperæmia which, if kept up for a few months, will work wonders. Since I first brought to notice that we could thus avoid operation for cataract, if observed in this early stage, there have been scores of nostrums, all claiming special virtues and special originality. The fact is that it is not the particular method which cures; it is the hyperæmia induced, and nothing else, which effects the amelioration.

On *Cataract in Glaucoma*, as well as the other issues in this article those wishing more extensive acquaintance with my views and methods, will find it in my monograph on cataract ('Treatment of Cataract,' pub. Butterworth & Co., Calcutta).

CHALAZION

This condition is due to obstructed and diseased meibomian glands. It is noticeable on the outside of the upper lid as a local swelling. Evert the lid, and you see it more marked on the inner surface. Cocainize and split the tumour from end to end from underneath, and scrape out every trace of diseased tissue and its capsule. If you leave the capsule, it will return again.

CHEMOSIS

Chemosis from any cause, if intense, should be freely scarified, which can be easily done with a few snips of good scissors. The free bleeding which follows, will prove beneficial to the causing condition. It will ease the eye of the congestion from which it is suffering. Do not hesitate to repeat the scarification, if necessary.

CORNEAL ULCER

To classify corneal ulcers would be too extensive a subject to deal with here. But I shall deal with the more common of them. In the first place, let us consider what not to do. Atropine is handed down to be used in all cases without any *rationale*. Cocaine is used in addition to atropine, to control the photophobia. The ulcer is in most cases due to some conjunctival condition, which both drugs intensify. Atropine undoubtedly elevates the intraocular tension and thus increases the liability to perforation. It is intended by these schools to draw the iris away from the infected area and thus prevent its incarceration in case of perforation.

Suppose it does what its advocates wish; then it will leave the anterior chamber open to infection. This, of all things, is what we want to avoid. Does it do this? It does not. Assume it to be away from the base of the ulcer at the moment of perforation; then follows the sudden escape of aqueous and the equally sudden contraction of the pupil and its incarceration. Thus, it is in any case flushed into the opening and incarcerated there. Thus, nature has providentially stopped the gap of infection and saved the eye, which design was not in the professors' method. In any case, it has served no useful purpose.

In the case of most ulcers, the eye should be slightly cocainized, so as to facilitate dealing with it. The patient being put on his back, a speculum is inserted and the lids lifted forward on it. An assistant now douches out the eye freely. The eye is steadied with a catch forceps and the area dried with a swab. With a probe, on which some absorbent cotton is twisted to a

small point, loaded with 60 gr. to the ounce nitrate of silver in distilled water, is applied to the ulcer. After a second it is neutralized with salt solution. This is the best of all caustics or cauteries. It is superficial in its action and is capable of being controlled with salt solution, whereas carbolic acid, which is now fashionable, is neither superficial nor under such control. No dressing is required. Any collection in the conjunctival sac should be regularly flushed out. It is astonishing to see a patient going from bad to worse with photophobia and is having drops containing copper sulphate, cocaine, atropine and possibly more drugs, when he has received one such treatment with nitrate of silver, after a few hours able to open his eyes. The indication is that the photophobia is due to the active ulcer, and the improvement indicates that the active process has ceased.

If the ulcers are phlyctenular, they are usually at or outside the margin of the cornea; in this case, a few drops of 1 in 4,000 cyanide of mercury, injected beneath them subconjunctivally, which balloons them from the sclerotic, will generally control them.

ENTROPION OR TRICHIASIS

What is called trichiasis in India in common terminology is generally ENTROPION, due to chronic trachoma. The important fact here is that the treatment is the same for both conditions. There are many operations for these conditions and many instruments. I will now describe the one I have found most satisfactory. The instruments required are a good pair of toothed forceps with 3 or 4 teeth in each jaw, a Graefe's knife (cataract knife) and some needles, horse hair and a pair of scissors and a spatula. The upper eyelid is caught by the margin with the forceps and turned out a little. The Graefe's knife is put through the tarsal cartilage obliquely behind the hair bearing area sufficiently to avoid cutting the hair bulbs. It is entered in the middle and the cartilage is cut *right to the canthus* of one side, then *to the canthus of the other*, taking care that the cartilage is *cut clean through*. A spatula is placed under the lid at this stage and a strip of skin (ellipsoidal) is marked out with a knife just above the hairs below and from end to end. This strip is about 4 or 5 millimetres broad in the middle. It is now caught up with toothed forceps along with the orbicularis muscle beneath it and excised with the scissors. The edges are brought together with three or four interrupted hair stitches and dressing applied. The cartilage must be cut clean through. In this case, with the oblique cut, the lower flap slides up on the upper one. Everything depends on this. If this is done, it will be found that a very small skin excision is necessary.

ENTROPION OF THE LOWER LID is not uncommon. The immediate cause of this entropion is that the continued spasm has caused a band of the orbicularis muscle to become dislocated up close to the ciliary margin, in which position its mechanical advantage has caused inversion of the lid margin. This is so marked that it can be seen by anyone on the lookout for it.

The treatment takes this fact into account. A small ellipsoidal piece of skin is excised and a piece of the offending bundle of muscle is excised and the area stitched up. The *sine qua non* is the excision of a piece of the offending bundle of muscle. These cases should be anesthetized with 1 in 100 novocaine subcutaneously.

GLAUCOMA

This is a common disease in India. The patient complains of his vision—of a wearing pain in the temple as a rule; often, also in the eye. He sees rainbow rings of light and his eye feels harder (to the fingers) than usual. He should at once be sent to an ophthalmic hospital.

GRANULAR LIDS OR TRACHOMA

This is the commonest ophthalmic condition met with in India. I will not go over the many methods of dealing with this condition, but will confine myself to what my extensive experience has dictated as at once the simplest and most efficient.

SOLUTIONS NECESSARY.—A saturated common salt solution in water; four per cent. cocaine solution; a solution of nitrate of silver 60 grains to the ounce of distilled water. The patient is best placed on his back on a table. Both lids are turned out and so adjusted that the ocular conjunctiva is not visible. The diseased area is then cocainized for about a minute or more. A brush of the nitrate of silver solution is applied after the cocaine has been brushed off with a swab of the salt solution as it is a chloride and would otherwise neutralize the silver solution. Allow the silver salt to act for about ten seconds and then neutralize it with some of the salt solution. If the conjunctival sac has been cocainized, and some of this silver solution gets in, it may do slight damage to the cornea. If it is not cocainized, the irritation caused will cause a reflex flow of tears, which will neutralize it: this reflex is put out of action by the cocaine. A repetition of this procedure every day or every second day for a week will generally put matters right. It is not more painful than sulphate of copper or strong perchloride of mercury solution and is more efficient, and is under control with the salt

solution. In a mild case give less, and in a severe case give more exposure to the nitrate before neutralizing with the salt solution. Tell the patient, if he has much pain, to use hot fomentations, which will ease matters.

In no case use cocaine or atropine drops for the control of any ophthalmia. These drugs only cause the conditions to flare up and get much worse. There is nothing more marked in therapeutics.

HYPOPION

This is due to a corneal ulcer in a low state of health or to an iritis; these conditions are dealt with separately.

Flush out the conjunctival sac as for any major operation, cocaineize and slip in a cataract knife and make an opening commencing subconjunctival at the sclerocornea, cut it to about an eighth of an inch and depress the lip of the wound, when the pus will rush out with the aqueous. Do not withdraw the knife till the aqueous has escaped, as, otherwise, the iris will flush into the wound and defeat your object. This procedure should be repeated without hesitation, if necessary.

IRITIS

This condition is generally syphilitic, not infrequently rheumatic and occasionally gonorrhœal. It is evident when the eye is examined with light concentrated on it with a strong lens such as used for examining purposes, *viz.* a +10D or +18D, as having lost its lustre and become at least sluggish in reaction to light. It will thus be seen, in all probability, to be adherent to the lens in places more or less extensive. An important point in diagnosis is that the syphilitic form is *painless*, whereas the rheumatic is very painful and the gonorrhœal is very acute.

As regards the treatment there is no time to be lost. It is urgent on account of the adhesions. Atropine B.P. solution should be instilled frequently so as to get it rapidly under its influence and from whatever cause, there is only one other drug of use, *viz.* mercury in some form. My favourite is blue pill. The patient should have a grain of blue pill or half a grain of calomel every three hours day and night with one-sixth of a grain of opium—the opium to prevent purging the patient. Mercury will not act if the patient is purging. This should be continued until the patient begins to show signs of the constitutional effects of mercury in the mouth, when it should be stopped until such symptoms subside. It should then be continued in grain doses of blue pill three times daily without opium. If this procedure is adopted you will induce the constitutional effects of

mercury usually in 24 hours. Half a dozen leeches should be applied to the temple at the commencement. For some reason or other, the atropine and mercury act much more efficiently with the leeches than without them. The patient should also have hot fomentations four times daily. If in 48 hours the atropine does not dilate the pupil under these conditions, it should be stopped. Its one object is to dilate the pupil and get it away from forming adhesions in the least desirable position. If it fails to do this, it is only doing harm, as it increases the congestion and tension.

Most cases of iritis will rapidly subside under this treatment. If adhesions form, there will be great liability for it to recur. For some reason or other, an iridectomy renders the patient not liable to these recurrences. It is thus, in the case of adhesions, advisable to do an iridectomy when the iritis has completely settled down.

This is an appropriate place to draw attention to too free use of atropine as regards its poisonous effects. Apart from the dry throat, the patient becomes mildly delirious and fumbles with the clothes. If such symptoms appear, it is wise to stop the atropine and recovery will take place in a few hours.

In the case of an occluded pupil, it is always wise to do a liberal sized iridectomy both for visual purposes and for preventing recurrence of the iritis. An occluded pupil, by interfering with the aqueous circulation, is generally supposed, I presume on theoretical grounds, to increase tension and cause glaucoma. Its influence in this respect is grossly over-estimated. I have never seen glaucoma from this cause.

The whole back of the iris does not adhere. It is invariably only the very pupillary margin which adheres, so that in these cases there is always a posterior chamber.

IRRIGATION OF THE CONJUNCTIVAL SAC

In the case of a normal conjunctiva, we irrigate before operation for cataract, etc. As is usually done, by lightly lifting forward the speculum and pouring in some solution at no pressure at all, we are depending on the drug and not on the flushing. We do not reach the recesses, so that if the drug had magic effects, which it has not, it would not get at the offending material. To a very large extent, people are deluded by depending on the drug. Such cleansing is largely ceremonial. This agent of irrigation, if properly used, is as powerful in a conjunctival sac as it is in general surgery. The irrigator should be six feet above the table. It will thus give a stream with six feet scouring pressure. The speculum should be inserted, the eyelids lifted for-

ward on the speculum and the brow drawn upwards so that every fold of the sac is exposed to the eye of the observer. If the douche is now turned into the sac for a minute, it will have scoured, in mechanical fashion, every corner of it clean. The douche I use is 1 in 2,000 of perchloride of mercury, which is quite safe and is an irritant which will induce a little hyperæmia, which is useful. In the case of gonorrhœa and ophthalmia neonatorum, if such an irrigation is done three or four times on the first day, the result will be seen to be remarkable, and fewer douchings will be necessary on the succeeding days. The result is evidently due to the frequent mechanical cleansings.

LACHRYMAL SAC DISEASE

In this condition there is excessive mucus secretion, with obstruction of the nasal duct. Obstruction of the lachrymal duct, in my observation, seldom, if ever, occurs. When watering of the eye occurs, press with the finger tip over the sac, and if mucus comes back through the lachrymal punctum, this condition is present. In syringing it, water seldom makes its way into the nose. It is well, in the early stage, to inject into the sac a few drops of 60 gr. to the ounce nitrate of silver daily for a few times, which should sterilize it and set up a mild inflammation. When this subsides, if the condition persists after a few weeks, there is nothing to do but excise the sac or make a large communication between the sac and the nose. The latter is on trial and has not many advocates, though it is theoretically the proper thing to do. To excise the sac, make a crescentic incision in the normal flexure in that region from the level of the upper punctum along the flexure downwards and finally outwards. This incision should all along be down to the bone. With a dissector separate the sac from the lachrymal bone along its full length. Now seize it with one or two pairs of Spencer Wells forceps and twist it up, separating its attachments as it comes up, cut it at either end, and continue the separation till it is completed. The nasal duct should be cauterized with pure carbolic acid and the skin sutured. The result is better than before, though in spite of what authors say, the tears do make their way to the face more than in a normal eye, though not so much as when the diseased sac is in its normal position.

To make a fistula into the nose is not so easy and is not always successful, as the fistula, if not of liberal dimensions, closes up. I commenced with a large shoemaker's or saddler's punch. I deliberately split the sac from the face, lifted each edge and skin on a stitch to be used as a pair of retractors, cleaned out the sac with a spoon and passed one limb of the punch up the nose into position and placed the punch in,

the lowest part of the sac and excised a disc of the sac, lachrymal bone and nasal mucous membrane. The punch took out a disc of five millimetres. I there and then stitched up the face wound in the sac and skin. The result was splendid, but in about two months the fistula closed again in all cases. The Rhinologist operates entirely through the nose, which I regard as absurd. You neither can see well what you are doing, nor can you get at the region with instruments to do it. I now prefer to turn the sac out of position as if going to excise it and thus to get direct at the lachrymal bone and take a disc out of it with forceps about a centimetre in diameter. I then replace the sac, open it as above described and clean it out and take a six-millimetre disc out of it and the mucous membrane of the nose with the saddler's punch. I then push a wooden spatula up the nose and from the face push the needle armed with catgut through the sac and nasal mucous membrane into the spatula and withdraw the spatula which acts as a needle-holder. I now push a dressing probe down through and out of the nose and thread the catgut on it and fetch it back and rethread it on the needle and repeat until I have completed the suture, and then close up the wound in the sac and in the skin. This is the most modern and most satisfactory method of dealing with it. It differs from any method described so far, in that you can see what you are doing and you make sure, by suturing the two mucous membranes, of establishing a permanent lachrymonasal fistula.

LEECHES

In using leeches for any inflammatory condition of the eyeball, you cannot go wrong. One leech is not much use: half a dozen will be efficient. The powerful and prompt effect of leeches is not sufficiently appreciated.

PANUS

Panus is the result of trachoma and other conjunctival inflammations. There are two methods of dealing with panus. (The cause requires to be dealt with separately.) A peritomy or a subconjunctival injection. A peritomy, as the term implies, consists in excising a narrow strip of conjunctiva and subconjunctival tissue circum-corneal down to the sclerotic. This will be effective. A milder measure—and a more efficient one, as it deals with the disease on which the panus is superimposed and with the ulcers consequent—is a subconjunctival injection of cyanide of mercury in 1 per cent. acon, giving a hypodermic of morphia at the same time to control the pain following the injection. The eye should be cocaineized well to start with. The strength of the cyanide should vary with the

age, as the reaction increases with the age if a standard solution be used: 1 in 2,000 under 18; 1 in 3,000 from 18 to 40; 1 in 4,000 from 40 to 60; after 60, 1 in 5,000. It is important to make sure you are supplied with neutral cyanide, as oxycyanide is very irritating. This will set up an intense oedema, which will subside in a few days, when it will be seen that the panus is gone, the ulcers healed or rapidly healing, and the cornea rapidly clearing up from the periphery. There is nothing more marked in surgery than the use of cyanide in this way: it is both simple and safe. With acon and a full dose of morphia, it is painless, but without them, it is objectionably painful.

PTOSIS

There is no condition of the diseased eye for which there are so many operations put forward—which indicates that none of them is satisfactory. What I consider the best, which happens also to be the simplest, I shall now describe.

The condition is usually syphilitic, though this is not always the case. In the early or acute stage—and it is not a very early manifestation of syphilis—reliance should not be placed on mercury. Iodide of potassium in 50 gr. doses, three times daily, has an effect which is rapid and will cure the condition satisfactorily, whether syphilitic or not. The patient stands these huge doses just as well as 5 gr. doses. If the Iodide is giving trouble, whether the dose is large or small, add to the dose 2 or 3 minims of *Liq. arsenicalis*, which will overcome the difficulty. Small doses of Iodide, such as are usually ordered, are futile.

A case came to me at Amritsar, after spending a year in London. The treatment had been mercury and 5 gr. doses of Iodide: the result was nil. I gave him 50 gr. doses, and even at that stage he became alright in a few weeks. (Syphilitic). Another case came to me—non-syphilitic, but middle-age diabetes. He was a professor in a medical college where he had the usual small doses: result nil. I gave him 50 gr. doses of Iodide, and the condition cleared up in a few weeks.

In the late stage, drugs are of no use. We have no alternative but operation. I imitate the result which the barber often obtains in his operation for trichiasis when he takes out too much skin, but, as in the Indian plastic operation for cut noses, I adopt the proceeding in a more surgical fashion. I inject sufficient 1 per cent. novocaine into the field of operation. This is better than a general anæsthetic, in that we can use the patient's will to see that we make the two eyes match. I then make an incision down to the cartilage, from end to end. I then dissect the skin and orbicularis from the

cartilage and fornix right up to the skull and separate the brow from the skull. I then pass three needles with horse hair down into this space through the whole thickness of the hairy brow and lift the upper edge of the cartilage on each needle, bring out the needles a little distant from where they entered, and tie the stitches over a small roll of bandage or over a bougie. In tying these stitches, make the patient open the sound eye as wide as he can and adjust the sutures so as to open the eye a millimetre or two wider than the sound one. We can then cut any redundant skin off the lid and stitch up the skin margins. The deep stitches can safely remain in for a fortnight. This is incomparably the best of the ptosis operations and the simplest.

PURULENT OPHTHALMIA, GONORRHOEAL OR OTHER

This is an emergency of the first rank. From the very commencement, the greatest care must be taken of the sound eye, or it will become infected from the diseased one. Hence the patient must be warned not to put his hand near the sound eye, and if a child, the sound eye should be excluded with first class adhesive plaster.

If this condition is allowed to progress unhindered, it will often completely destroy an eye in 24 hours. It varies in severity, but is generally very rapid in its progress.

If oedema of the eyelids is present, the outer canthus should be freely cut with a snip of a good pair of scissors so as to relieve all pressure on the globe and by the blood which will escape to relieve congestion of the area; atropine and cocaine should be avoided as they only intensify the inflammation. If pain requires to be relieved, opium or morphia should be used without hesitation. It is devoid of the evil effect of cocaine. Bacteriological investigation may be interesting, but should not delay action for one minute.

The outer canthus being cut, and the patient on his back on a table, an assistant should lift forward the lids on a pair of large squint hooks, so as to completely expose the whole conjunctival sac. The operator should have a douche 4 or 5 feet above the table, so that a stream from it will have efficient scouring effect, bearing in mind that the mechanical clearing out of all pus and debris is more important than the antiseptic used. He turns a stream from the nozzle of such douche into the exposed sac for a minute and releases the eye. He should use no dressing but leave it open for the escape of any secretion. If this process is repeated every three hours for the first day, there will not be much required afterwards and the patient will

escape the complications which follow hesitancy. 1 in 2,000 perchloride of mercury is a perfectly safe and reliable douche.

I repeat, in order to emphasize, the fact that the mechanical cleanness is the all-important fact in the treatment. It is just as important here as in an acute suppurating knee-joint. Draining in this latter case, as is commonly done, leads to disaster and very often to amputation. If the knee-joint is laid half as freely open as for an excision and a half-inch hose with six feet pressure be scoured into every corner of the joint three or four times during the first day, thus scouring out any accumulation, it is found that the following day everything is progressing favourably.

STYE

This is an abscess of the hair root canal. Extract the hair and open up the abscess. They are usually frequent in the same patient. If you give the patient $\frac{1}{4}$ gr. of calcium sulphide in pill three times daily for a few days, it will stop this predisposition as well as furunculosis in general.

TINEA TARSI

This is usually an obstinate condition. X-rays should kill this parasite, as it does similar disease of the scalp, but in the case of the eye it is a dangerous remedy. If used, a piece of lead foil should be cut out so as to fit the conjunctival sac and inserted so as to save the eye from exposure. (The great danger of X-rays on the unprotected eye is of causing cataract.) We have other remedies, which, if not so rapid are equally successful. Start with hot fomentations to loosen the scabs. Then with a good forceps made for the purpose, using a magnifying lens, extract every hair, however small, and when all bleeding has ceased, give the margin a heavy rub of a nitrate of silver stick, taking care of the conjunctiva and cornea. When finished, wash off with salt solution. This will produce a scab of its own, which can be removed after three or four days. Repeat the nitrate of silver once, and this will generally be found sufficient. The mild measures of giving the patient ointments to use are useless.

Electrolysis for trichiasis would conveniently come in here. I mention it to condemn it. When successful, the hair-bearing portion of the lid atrophies leaving the margin thin as the third eyelid of a bird—a gross disfigurement.

TONOMETER

There are a number of brands of tonometer on the market. It is a very useful instrument for accurately estimating the ten-

sion of an eye, especially in the early stage of glaucoma, when such is suspected. (Schotz is the one I always use.) This section is to point out how to use a tonometer. It is a tricky instrument and can be very deceptive. The user should commence with a course of observations on the healthy eye, so as to come to understand the ranges of tension in health. With a Schotz it would average under 20 millimetres of mercury. 30 is regarded as distinct glaucoma. Put the patient on his back on a table in a good light. One instillation of 4 per cent. cocaine is sufficient. Put in a speculum. Use the smallest weight of the tonometer. If that gives no indication, use the next, and so on, till you get an indication. The smallest weight which will give an indication is the right one. Now, use the larger weights which give a big indication and compare the results, and you at once see that they are not in harmony, as the innocent would think they should be. *The smallest weight which gives a distinct indication is the right one.* In applying it to the eye, lift forward the speculum so as to remove all outside pressure from the eye and take three or four readings. The left hand half of the scale of a Schotz tonometer should be cut off, and not used, as readings from that half are misleading.

WOUNDS OF THE EYE

If there are particles embedded in the cornea, cocaine and pick them out with a needle, and with the end of a fine probe touch the region with 60 grains to the ounce nitrate of silver, the best antiseptic we possess for such purpose. It will be seen to whiten the raw area, not affecting the healthy cornea. If it is a perforating wound in the cornea, there is almost certain to be adhesion or prolapse of the iris. If so, do not interfere with the iris further than the use of nitrate of silver, as in the previous case. The prolapse is nature's method of shutting off infection, and very efficient it is. The result of this prolapse should be dealt with later on, when all is quiet. Atropine and cocaine should be avoided, as they serve no purpose and do harm.

If the perforating wound is in the ciliary region, the eye should be enucleated, as sympathetic ophthalmia is almost certain to follow even a minor wound involving the ciliary body. Cases have been reported in which, under certain treatment, this did not follow. With all due deference, I should say that I have never seen such policy adopted in which it was not ruled.

If a foreign body is in the eye, the patient should be at once sent to an ophthalmic hospital.

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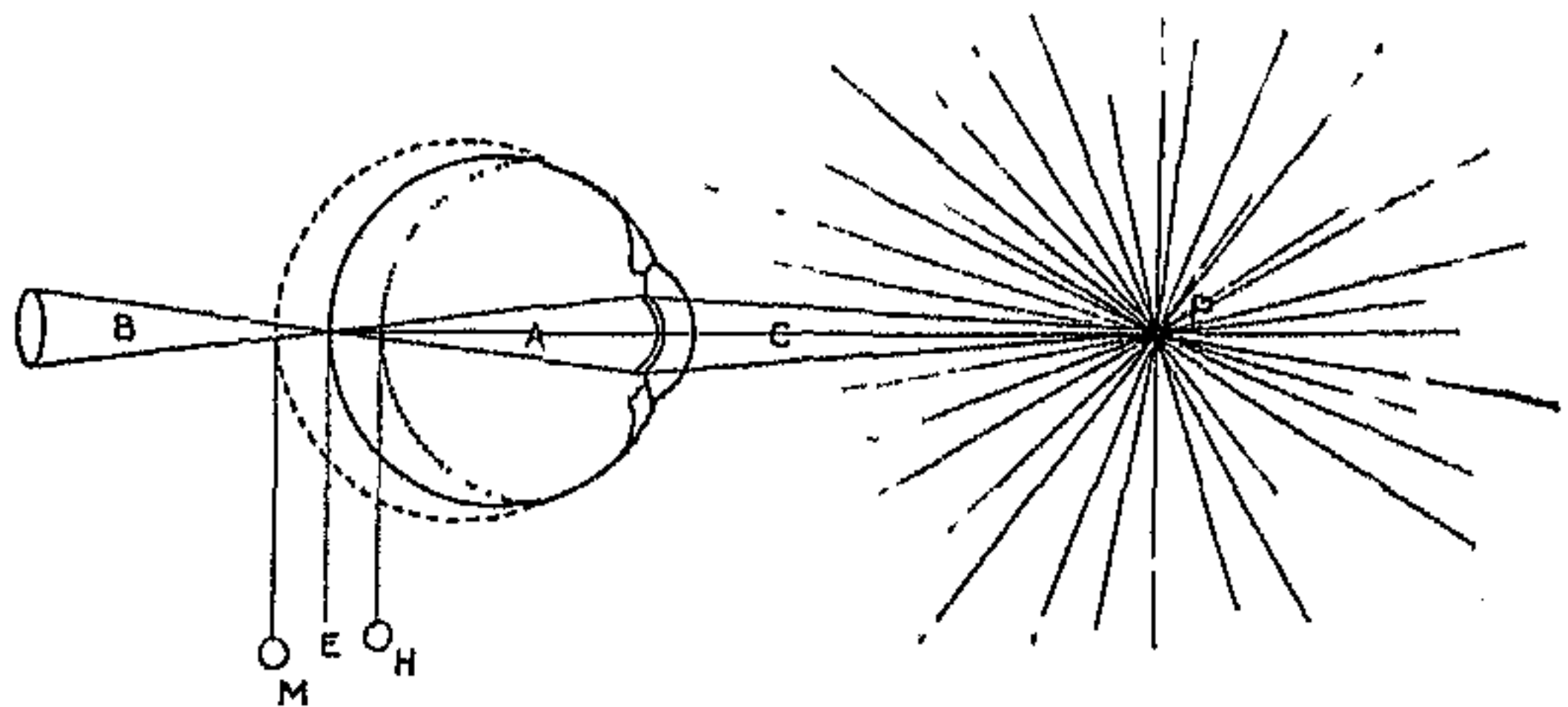
ERRORS OF REFRACTION

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The image of an object must be sharply focused on the retina, in order that it may be clearly perceived by the eye.

Any object may be regarded as being composed of a number of points. Rays of light, which illuminate an opaque object, are reflected in various directions from each of such points. Rays, which enter the pupil after being reflected from a point, are bent towards each other by the refractive media so as to form a cone-shaped bundle; an image of the point is formed at the apex of this cone (*the principal focus* in the case of parallel rays); and an image of the whole object is formed by a series of such apices. The refracted rays intersect at the apex of the cone, and, if their path is unobstructed, they then diverge so as to form a second cone-shaped bundle whose apex is continuous with that of the first.



Rays reflected from a point further distant than six metres (or 20 ft.) are parallel, or nearly so, as they enter the eye (the more divergent are cut off by the pupil); those whose source is nearer than this are divergent; and the closer the point lies to the eye, the greater is the divergence. Given the same degree of refraction, the cone formed by such divergent rays will be longer than that formed by parallel rays.

Normally, the apex of the cone formed by parallel rays lies upon the retina, and so focuses sharply the image of a point

(*Emmetropia*); but, either owing to a change in refractive power, or to an abnormality in the length of the eyeball, the apex (focus) may lie (1) in front of the retina (*Myopia*), or (2) behind the retina (*Hypermetropia*). The point does not form a clear image in these last two conditions, but appears as a diffused circle (*Diffusion Circle*). This is because the cone of rays in hypermetropia is cut by the retina before its apex has formed; and in myopia the secondary cone, which is formed after the intersection of the rays, is met by the retina at a place behind its apex.

In hypermetropia, the cone formed by parallel rays coming from a point further distant than six metres, is too long for the eye, whilst in myopia it is too short; that is to say, the hypermetropic eye is too short, whereas the myopic eye is too long.

Rays which are already convergent as they enter the eye will form a shorter cone than that formed by parallel rays, and, as previously stated, those already divergent will form a longer one. Rays coming from a point closer than 20 ft. being divergent, a sharp focus upon the retina of a myopic eye is formed of the rays reflected from a point placed at a suitable distance (*the Far Point*) near the eye. This image is obtained without any accommodative effort, since the myopic eye, even when at rest, is focused for divergent rays. No clear image of an object situated beyond this distance can be formed in myopia, however, without the aid of a concave lens to render the entrant rays divergent.

The amount of myopia in a given case can be estimated subjectively by measuring the distance of the 'far point' from the eye, and by dividing one metre, or 100 centimetres, by this distance. A patient with one *dioptré* of myopia has his far point placed one metre distant from his eye, and a patient with four dioptries has his at one quarter this distance, namely, 25 centimetres. If the far point is 20 cm. distant from the eye, the calculation is $\frac{1 \text{ metre or } 100 \text{ cm.}}{20} = 5$ dioptries of myopia. The subjective method should not usually be employed, however.

Rays which pass through a convex lens are refracted and undergo some convergence; those which pass through a concave lens undergo divergence. A convex lens placed before the eye, therefore, shortens the cone of rays, or advances the focus, whilst a concave lens lengthens the cone of rays, or causes the focus to recede. A convex lens is, for this reason, used in hypermetropia, and in the presbyopia of a normal eye when it is desired to obtain, without the use of accommodation, a sharp focus of rays which diverge from a near object. A concave lens is employed in myopia.

* A hypermetropic person is able, by increasing the convexity of the lens in his eye, to obtain a clear view of a distant object provided that his power of accommodation is sufficiently great; this power decreases as his lens becomes more rigid with advancing years. Hypermetropia is often unrecognized by the patient, or latent, as long as he is able to neutralize the error by an accommodative effort; indeed, myopia may sometimes be simulated owing to excessive accommodation. A continued effort of this nature is likely to cause symptoms of eye-strain. Over-convergence may be associated with this exercise of accommodation.

Rays entering the eye are not always equally refracted in every meridian, but those which pass through one meridian may be more bent than those entering at right angles to it. In this case, the cone of rays will be compressed, so that its apex is not pointed, but is shaped like the extremity of a cold chisel or of a screw-driver; the retinal image of a point will in consequence be elongated (*Astigmatism*). A point of light appears pulled out in one direction, and a full moon appears oval to an astigmatic eye. (N.B.—The eye not under examination should be occluded.)

If a patient with astigmatism looks at a dial, on which lines radiating from a common centre are drawn, he will notice that the lines running in one direction appear more sharply defined than do the rest. This is because the retinal images of the points which compose the sharply defined line, are placed with their long axis in the same meridian; although each image is elongated, yet one overlaps the other, so that a combination of the whole appears as a clearly focused line. In the case of the lines seen mistily, the elongated images are placed one beneath the other, with the long axis of each image at right angles to the meridian occupied by the whole line; these lines, therefore, appear wide and diffused.

Astigmatism is corrected by the use of a cylindrical lens.

An astigmatic person can often obtain good vision by using his accommodation whilst looking through half-closed lids. A low degree of astigmatism may be the cause of an obstinate hyperæmia of the lid margins.

Visual acuity is commonly estimated by the use of Snellen's test-types. These are so designed that each letter, when placed at the distance stated above the line to which it belongs, subtends at the eye an angle of 5'. The letter is contained within a square; this is divided into 25 smaller squares (5×5), and, at the appropriate distance, each of these subtends an angle of 1'. The smaller squares are used to build up the letter; the width of any stroke composing the letter is that of one such square,

and any interval in a stroke is equal to one or more small squares.

Visual acuity is recorded as a fraction. The distance of the card from the patient is taken as the numerator, and the number which belongs to the line of the smallest letters read is taken as the denominator. Thus, the card is usually placed at a distance of 6 metres; if the patient can read no smaller letters than those normally seen at 18 metres, his vision is recorded as 6/18; if he distinguishes none smaller than those marked 8 metres, his vision is 6/8, and so on. Each eye must be examined separately, and the card must be placed in a good light and in the vertical position.

Since the normal, or emmetropic, eye, when at rest, is focused for parallel rays (its far point is at infinity), some alteration is required when a near object, such as small print, is looked at, and it becomes necessary to focus divergent rays. This *Accommodation* is effected by increasing the convexity of the lens through the action of the ciliary muscle. 'The Near Point' is that point from which come the most divergent rays that the eye is able to focus whilst exerting its maximum amount of accommodative effort. As age advances, the lens becomes more rigid, and accommodative power lessens; the near point, therefore, recedes from the eye. This diminution of accommodative power normally becomes apparent between the ages of 40 and 45 (*Presbyopia*), the patient notices that he requires to hold his book further from his face, but that a convex spherical lens of 1 dioptré enables him to read small type without undue strain at his normal reading distance. A hypermetrope experiences these symptoms at an earlier age, since his eye, when at rest, is adjusted for convergent rays, and a proportionately greater demand is, therefore, made upon his accommodative power. A myope of more than three dioptries, on the other hand, having his far point situated within 33 cm. from his eye, can read small type without accommodating; such a person is able to read print without glasses, even in old age, provided that his eye is otherwise healthy; he will, however, require to wear glasses when he wishes to see distant objects clearly.

Correcting glasses for presbyopia can ordinarily be prescribed according to age; a convex lens of one dioptré is prescribed at 45, and another dioptré is added every five years up to the age of 55. Over-correction must be carefully avoided, since it is likely to cause a difficulty in convergence. Residents in the tropics usually need a proportionately stronger lens than do those in a temperate climate.

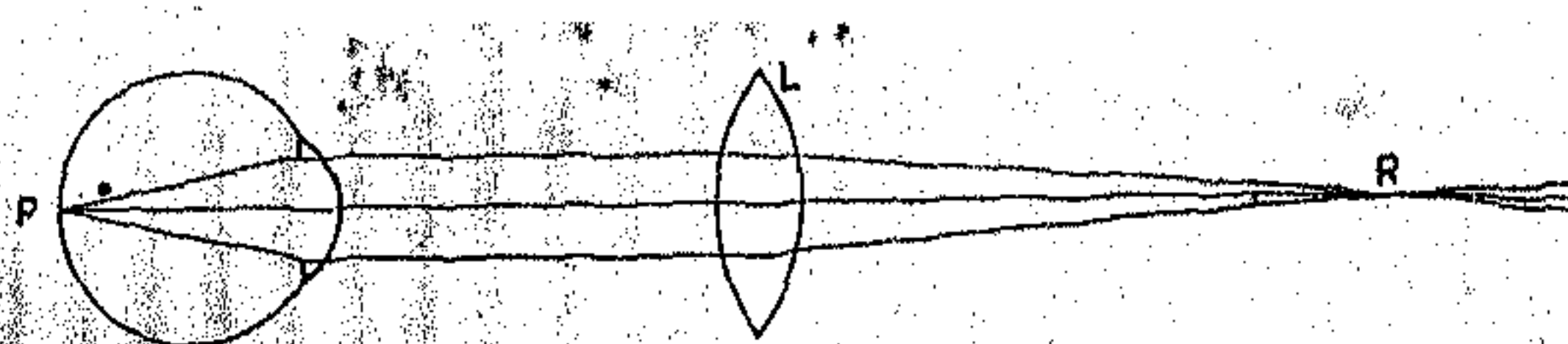
A subjective examination of the refraction and the sight may be made as follows: (1) Seat the patient at a distance of 20 ft.

from a card of Snellen's test-type; (2) adjust on his face a trial frame, designed to hold two lenses before each eye; (3) place before each eye a lens of such strength as will over-correct the estimated amount of hypermetropia by two dioptres, or under-correct any supposed myopia by three dioptres; (4) ask the patient to look into the distance and to attempt to read the large type; (5) whilst he gazes at the letters, place a 0.5 D concave lens before those already in position and encourage him to read further; (6) remove the lenses last fixed and replace each by a 0.75 D; (7) continue to add concave lenses of gradually increasing strength until the best vision is obtained. (N.B.—The lens originally placed in the frame is left undisturbed throughout.)

When the acuity of vision has been brought to 6/18, the lens before one eye is replaced by a black disc, and the test is continued on the other eye alone. (Relaxation of accommodation is aided by the use of both eyes at first.) The highest convex lens, or the lowest concave lens, with which clear sight is obtained, will signify approximately the degree of hypermetropia or myopia present. Ability to read part of the 6/6 line, whilst mistaking some letters on the 6/12 and the 6/8 lines, is suggestive of astigmatism.

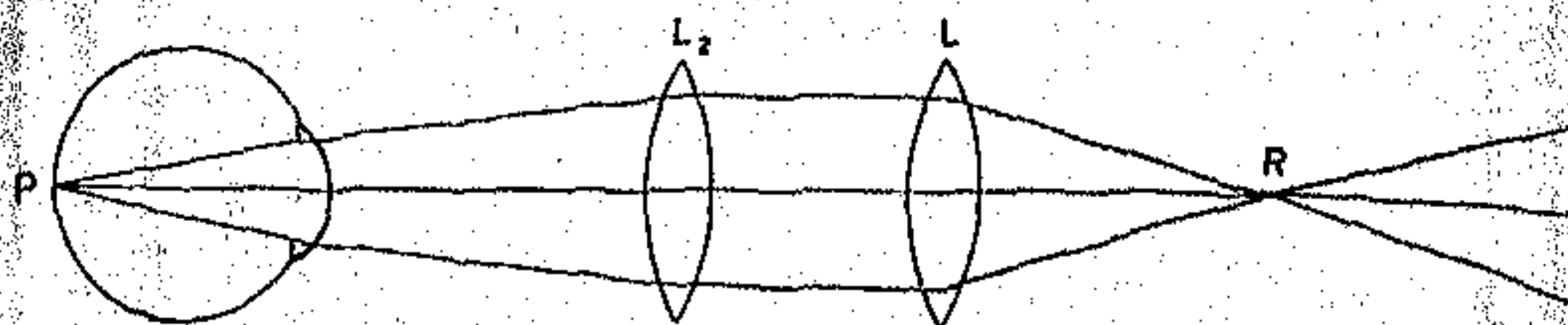
The lens originally laid in the posterior cell of the trial frame is next replaced by the appropriate spherical correction, in front of which is put a cylindrical lens. The axis of the cylinder is slowly turned through an arc of 180° until a position is found in which the sight improves. Stronger and weaker cylinders, with their axis in this position, are then tried in combination with stronger and weaker spheres until acute vision is attained.

The objective estimation is best made by RETINOSCOPY. Rays coming from an illuminated point on the retina emerge from the eye (1) parallel in emmetropia, (2) divergent in hypermetropia, and (3) convergent in myopia. The convergent rays in myopia intersect at the far point of the eye, *i.e.* at a point whose distance from the eye will, if measured, declare the degree of myopia. (If this point is at 1 metre there is 1 dioptre of myopia.) Parallel and divergent rays may be made to converge and to intersect 1 metre from the eye, if a convex lens of suitable strength is used. Convergent rays, which intersect within the distance of 1 metre, may be rendered less convergent, so that the point of intersection recedes to 1 metre, if a concave lens of suitable strength is used. A convex lens of 1 dioptre will be required in the case of parallel rays (Emmetropia), and in that of divergent rays (Hypermetropia) a convex lens of 1 dioptre, plus another of sufficient strength to render the rays parallel, will be necessary; the *latter* lens will be the



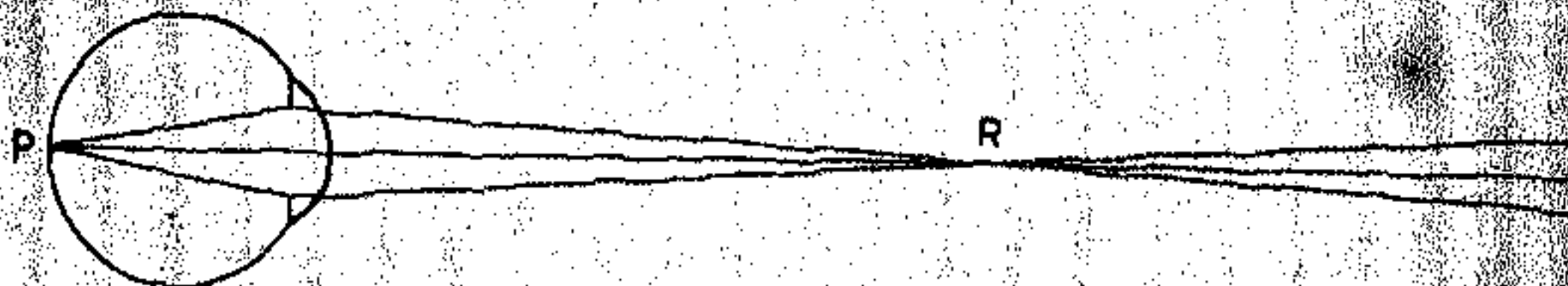
The course of the rays which emerge from an Emmetropic Eye.

The Emmetropic Eye, when at rest, is in focus for parallel rays. Rays from an illuminated point on the retina, P, are parallel as they leave the eye. If a convex lens, L, of one dioptré (1D) is placed in front of the eye, the emergent rays will be focussed at a distance of one metre, and will form a 'point of reversal,' R, at that point.



The course of the rays which emerge from a Hypermetropic Eye.

The Hypermetropic Eye, when the accommodation is relaxed, is in focus for convergent rays. (N.B.—These do not occur in the absence of a refracting element.) Rays from an illuminated retinal point, P, therefore diverge as they leave the eye. These divergent rays can be rendered parallel by a convex lens whose strength equals the existing Hypermetropic, L_1 ; and they may be focussed at a point of reversal, R, one metre distant from the eye, if a further one dioptré is added, L_2 .



The course of the rays which emerge from a Myopic Eye.

The Myopic Eye is in focus for divergent rays. Emergent rays therefore converge to a focus, or point of reversal, R, in front of the eye. (N.B.—This is the 'far point' of the Myopic Eye.) The number of dioptrés of myopia present can be estimated by measuring the distance of R from the eye, and then dividing 100 c.m. (1 metre) by this distance expressed in centimetres. The point of reversal may be caused to approach to, or recede from, the eye, if suitable concave lenses are placed in front of the eye. The lens which fixes the point of reversal at one metre measures all the myopia present with the exception of one dioptré. It is necessary to add this further dioptré in order to render the rays parallel.

measure of the existing hypermetropia. The concave lens, required to cause the far point to recede to 1 metre, is not the full measure of the myopia, since an additional dioptré is necessary to make the rays parallel. When performing retinoscopy at a distance of 1 metre, therefore, 1 dioptré must be subtracted from a convex lens or added to a concave lens, in order to calculate the right correction from the lens used.

If the eye of the observer is closer to the examined eye than the point of intersection, an erect image of the illuminated spot is seen; if it is the further away, an inverted image will be seen. A spot of light moving upon the retina will, therefore, appear to reverse the direction in which it travels on either side of the point of intersection (called the 'far point' or 'point of reversal').

The examiner usually employs a plane mirror to reflect light into the observed eye, and, seating himself one metre away, throws the light into the eye and slightly rotates the mirror. In this case the shadow, or edge of the illuminated area, appears to move in the same directions as the mirror, as long as the image is erect (whilst the observer's eye is closer than the point of reversal), but appears to move in the opposite direction to the mirror when the image is inverted (when the point of reversal lies between the observer and the eye under examination). In emmetropia, in hypermetropia, and in myopia of less than 1 dioptré, the 'shadow' moves with a plane mirror; in myopia of more than 1 dioptré, it moves against the mirror. The opposite occurs if a concave mirror is used to reflect the light. Lenses are placed in front of the patient's eye until one is found which causes the point of reversal to lie at 1 metre, *i.e.* which induces one dioptré of myopia. 1 D is added to, or subtracted from, this in order to estimate the true refraction. During examination, it is essential that the patient should look directly at the light, and that his face and the correcting lens should lie in the vertical plane.

In astigmatism, the point of reversal does not lie at the same distance in every meridian. The meridian in which it is nearest, and that at right angles, in which it is furthest, are estimated; the difference between the two represents the amount of astigmatism.

It would be difficult to exaggerate the evil effect that errors of refraction may have on the health of the eye, and upon the general condition. A refraction error frequently entails a strain upon the ciliary muscle, and may lead to a disturbance of the balance between the ocular muscles—especially to over-

convergence or under-convergence. Muscular strain causes hyperæmia, and so may render the conjunctiva and the lids unhealthy; and it may lead to disease of the deeper structures of the eye, should poisons be present in the system.

Headache is a common symptom; this may be ocular, frontal, temporal, or occipital; less frequently, it is felt on the top of the head. Occipital pain is often experienced, and the great occipital nerve may be acutely tender; sometimes, the pain runs to the nape of the neck, and may even reach the scapula. Giddiness, indigestion, and symptoms of 'neurasthenia' may be caused. The patient is often unduly tired by his day's work and is disinclined to exert himself. All the symptoms are intensified by any gastro-intestinal disturbance which, in its turn, is aggravated by the eye-strain; a vicious circle is thus produced. It is important to remember that *a child at school, who needs a suitable pair of spectacles, may be unjustly accused of laziness and stupidity.* Eye-strain is most likely to be marked during periods of ill-health, of convalescence, or of pregnancy and lactation.

The following rough test of convergence efficiency may be employed in cases of headache of questionable ocular origin: Ask the patient to gaze steadily at the point of a pencil held six inches from his face; as he gazes, place a slip of paper in front of one eye. If his convergent power is defective, the eye will be seen to swing outwards as it is occluded, but will resume its original position on being uncovered. An ocular cause for the pain may be strongly suspected, if this sign is present.

Every person who wears glasses should be most careful to ensure that the frames do not become bent, and that the lenses do not work loose and become displaced. Much eye-strain may be caused by a lens which is out of its true position, especially if the lens is a strong one.

TEST TYPES

D. 0.50

No. 1.	FELI	LEFI	FEEL	TFEL
	COOL	LODF	CODE	DOLF
	DLP1	110D	LEFT	FEEL
	OLOD	COLT	DOLL	COOT

D. 0.75

No. 2.	LLF	ELL	LLF	FOE
	GOD	TOD	COT	TOO
	FEE	LET	EEL	ELL
	ODO	OOD	IOO	DOE

D. 1.00

No. 3.	FELL	TOLL	DELL
	DOFE	FOOL	TOLD
	FLED	LOLL	CELT
	COLD	FOOD	DOFF

D. 2.00

No. 4.	TOE	OFT
	DOD	ODE
	LOT	FED

D. 6.00

No. 5.	L D T
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D. 9.00

No. 6.	F B Z
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Reading Type.

Distant Type.

COLOUR-BLINDNESS

TEST I

Give the candidate, in good day light, a skein of pale but pure green; and direct him to select, out of the bundle of wools, all those colours which appear to him to correspond to the test sample. If he does this correctly, it is unnecessary to proceed further, as the candidate has normal colour-sense. If, however, he selects one or several of 'the colours of confusion'—greys, buffs, straws,—he is colour-blind.

TEST II

To ascertain the kind and degree of the defect, give a pink skein to be matched. If this be correctly done, the candidate is incompletely colour-blind.

If blue and violet, or one of them, be selected, he is red-blind.

If he selects green or grey, or one of them, he is green-blind.

In the absence of an Edridge-Green lantern, it is better to use coloured beads, as wools in India quickly soil and bleach.

SURGICAL INSTRUMENTS, DRESSINGS AND ACCESSORIES

SURGICAL INSTRUMENTS

1. SELECTION OF INSTRUMENTS

The selection of a suitable equipment of Surgical Instruments is of vital importance to the Surgeon, and to ensure their efficiency and reliability as well as correctness of construction and design, they should, if possible, be purchased direct from the actual manufacturers; those sold by dealers are usually of a lower standard of manufacture, produced on a commercial basis, to allow of intermediate profits. Instruments made of steel should be hand-forged.

The instruments required for General Surgery are so well known that the individual Surgeon will have little difficulty in making his own selection. The fact that most instruments bear the name of the Surgeon for whom they were originated, forms a useful guide, and particularly so for the special branches of Surgery.

2. STAINLESS STEEL INSTRUMENTS

These are to be generally recommended, especially where the climate is humid, but the material is somewhat more hard and brittle and cannot be very accurately tempered for all purposes. It is not suitable for Knives or cutting instruments such as Chisels and Gouges. It answers extremely well for spring forceps, such as Dissecting Forceps, Iris Forceps, etc., and generally for Bow Forceps, but cannot be recommended for those with spring and arched blades, which are liable to snap under strain. Stainless steel instruments should never be stored or sterilized with racks tightened up as, owing to the nature of the material, they are liable to snap in this position in the sudden changes of temperature.

Stainless steel is only rustless if highly polished. Therefore, care should be taken of the surface of these instruments to avoid scratching. Box joints, etc. which cannot be reached by the polishing wheel should be carefully oiled; otherwise forceps may 'seize up' and break.

3. CARE OF INSTRUMENTS

(1) All instruments should be carefully inspected at least once a month, and every year they should be thoroughly over-

hauled by a representative of a Surgical Instrument firm. It is then decided what instruments are unfit for further service and what instruments will repay for repairing. I adopted this plan in India and found it the only way by which the whole equipment could be kept in thoroughly efficient working order, and always ready for use.

(2) Rusty spots frequently show the imprint of the fingers.

(3) There is an erroneous idea that a sufficient thick coat of vaseline will preserve an instrument for all time; but brown stains are frequently formed underneath it, which go deep into the steel, and necessitate re-grinding and re-burnishing.

(4) Gum elastic articles are liable to become sticky, if exposed to heat; they should be kept stored in Lycopodium powder.

(5) India rubber appliances must not be exposed to light or air; they should be kept at full length, and not allowed to bend or kink.

(6) Oily substances soften and destroy India rubber articles and should not be brought in contact with these. Glycerine or plain water may be used as a lubricant.

(7) India rubber will become hard in cold weather, but will resume its elasticity if gently warmed. If exposed to prolonged heat, especially dry heat, it is destroyed, becoming hard and brittle. Special qualities of India rubber are made for use in hot climates, *e.g.* Messrs. Down Bros.' Tropical rubber; but ordinary rubber articles will remain in excellent condition for years if kept over paraffin vapour. *See Storage of Instruments below.*

4. STORAGE OF INSTRUMENTS

(1) Whenever possible, instruments should be kept on glass shelves in special instruments cupboards.

(2) White paper should not be allowed to remain in contact with the Instruments, as some of the chemicals used in bleaching are frequently retained in the paper. Thin brown tissue paper (known as Sheffield paper) is generally free from these objectionable compounds (but as it is liable to absorb moisture, should be stored in a dry place).

(3) The sulphur in vulcanized rubber readily attacks metal, and therefore India rubber articles should never be kept in contact with metallic ones, but should be stored in a separate box; this applies to ether inhalers, mouth gags, etc.

(4) **PARAFFIN VAPOUR METHOD OF PRESERVING RUBBER.**—It is a common practice both in India and in the Federated Malay States—especially in those provinces where the atmosphere is extremely dry for certain periods of the year—to preserve rubber articles by keeping them in an atmosphere containing a small percentage of paraffin vapour. Boxes can be purchased in which the rubber articles are kept on a tray in the upper part, and a saucer with a little paraffin in it is kept below. It has been said that water is equally efficient, but this is not the case; rubber goods kept in the former way have been in good condition after ten years' use.

5. CLEANSING OF INSTRUMENTS

(1) After use, all instruments should be carefully washed with warm water containing a little washing soda or Sodium Bicarbonate and soap, particular attention being paid to the joints. A wire brush is recommended for cleaning the serrations in the jaws of artery forceps, etc. If the instruments are stained, they may be polished with a little magnesia and methylated spirit.

(2) No instrument should be touched with the naked hand, after being washed in the alkaline water, but gloves should be worn during the final operations of polishing and oiling. A rust mark will eventually be formed, wherever they are touched, if this precaution is neglected.

(3) After washing, they should be sterilized before being put away.

(4) On being taken out of the sterilizer, they should be wiped thoroughly dry, especially the joints, with a soft cloth, polished with a chamois leather and placed in the cabinet.

(5) Should it be necessary to protect them from moisture, a piece of lint, slightly moistened with liquid paraffin, should be rubbed well over them, leaving only a slight film. Vaseline, especially a thick coating, should not be used.

(6) Gum elastic catheters, etc. should be carefully cleansed after use with soap and water, dried, dusted with French chalk and stored, if possible, in air-tight tins.

6. STERILIZATION OF INSTRUMENTS, DRESSINGS, ETC.

1. **CATGUT.**—Is best sterilized when wound loosely on a glass spool and immersed in the following solution—Iodine 1 part, Iodide of Potassium 1.75 parts, Distilled Water 100 parts—for 12 days in the dark; it is then removed and kept dry.

Before use, it is placed in rectified or methylated spirit for a few minutes, to dissolve out the excess of Iodine. The process of sterilizing Catgut really demands bacteriological technique. *Vide* Medical Research Council Report, No. 138, 1929, but the above method is probably the simplest and best for surface sterilization.

2. CATHETERS.—Metal catheters should, of course, be boiled: the soft instruments should be exposed to a current of steam, both outside and in, but failing this, syringe through with 1 in 20 Carbolic and allow to soak in 1 in 2,000 Sublimate Solution. They can be kept aseptic by hanging in an atmosphere charged with Formalin Vapour.

3. DRESSINGS—enclosed in a bag or towel. They should be subjected to steam at a pressure of 10 lbs. (giving a temperature of 240°F.) for half an hour, but some Surgeons now consider necessary a pressure of 15 lbs. (250°F.) or 20 lbs. (259°F.). Failing access to a steam sterilizer, the dressings may be heated in a current of steam for one hour.

4. DRY CHEMICALS.—The sterilization of these can be effected by dry heat, three hours at 150°C., or one hour at 170°C.

5. ELECTRICALLY ILLUMINATED INSTRUMENTS.—Cystoscopes should not be boiled, as it would cause dimming of the lenses and possibly injury to the connections, but may be sterilized with Formalin Vapour. This is best effected by suspending the instrument in an upright jar, one or two crushed Formalin Tablets being placed in the bottom. The sheaths of catheterizing instruments should be previously rinsed with Methylated Spirit, but the Spirit should not be brought in contact with the lenses or the Plaster of Paris setting of the lamps.

Another method of sterilization is immersion in 1–8,000 Oxycyanide of Mercury. Formalin method, however, has the advantage that its supervision is easier.

Other electrically illuminated instruments should be sterilized in a similar manner.

6. GUM ELASTIC articles are best sterilized by Formalin Vapour.

7. HYPODERMIC INJECTIONS AND OTHER SOLUTIONS OF ORGANIC COMPOUNDS.—Suspensions or Emulsions of chemical substances decomposed by heat, *e.g.* Iodoform Emulsion, may be prepared by first sterilizing the suspending medium, then cooling, and then preparing the suspension in a sterilized mortar. The same applies to hypodermic injections

of decomposable substances in Vegetable Oils. Ordinary hypodermic solutions are sterilized at 100°C., for 30 minutes, or by heating in an autoclave. Cocaine Hydrochlor., Morph. Hydrochlor., Atropine Sulph., Quinine, Eserine Sulph., Strychnine, Adrenalin and Stovaine are decomposed by a temperature of more than 100°C.

8. HYPODERMIC SYRINGES.—The best method of keeping Syringes and Needles, so that they can be ready for use without sterilizing by boiling, is the use of the following solution:—

Ether. Sulph.	...	...	...	2 drachms
Lysol	...	...	...	15 minims
Spirit to	...	...	...	1 ounce.

The spirit should be basic industrial spirit, not methylated, that is without pyridine. It can be obtained from any druggist.

The syringe should be first washed under the tap, a small quantity of the solution drawn up into it, to get rid of moisture, and then ejected, and then replaced in the solution. If a deposit occurs in the solution, it can be filtered and used again.

9. INDIA-RUBBER GLOVES, CATHETERS, AND DRAINAGE TUBES may be sterilized by boiling.

10. INSTRUMENTS, SURGICAL.—All Surgical instruments should be sterilized both before and after use:—

(A) BLUNT.—(a) The usual method adopted is by boiling in a 1 per cent. solution of Carbonate of Soda. The solution should be allowed to boil, so as to drive out any contained air before immersing the instruments. Blunt instruments may be left in the boiling solution for five minutes. This prevents instruments being stained or becoming rusty; care should be taken that the instruments are fully immersed.

ALTERNATIVE METHOD.—(b) Boil the instruments in a solution consisting of 1 dr. of Lysol to each pint of water. The instruments are taken from the sterilizer, by an assistant wearing gloves, who dries them with a sterilized towel, before putting them in the sterilized trays, for the surgeon. By this method, the instruments show very little sign of rust after prolonged daily use, and the Lysol lubricates and keeps the joints in perfect order.

- (B) SHARP.—Sharp-edged instruments lose their edge when sterilized by boiling, and should, therefore, only be immersed for one minute. In no cases should they be placed in Carbolic solution, as this is also liable to affect the edges.

Personally I prefer to keep them constantly in Absolute Alcohol to which a drachm of Lysol has been added for every pint of Alcohol. This keeps them in perfect condition and always ready for immediate use.

The instruments are then laid out in sterilized trays. The trays may contain sterile water, or a weak antiseptic, but not mercurial or iodine solutions.

11. LIQUIDS.—The boiling of a liquid for five minutes is sufficient to kill ordinary germs, if no spores are present. The boiling of any fluid at 100°C . for $1\frac{1}{2}$ hours, will ensure sterilization in almost any circumstances. To ensure the killing of spores, it is usual to heat liquors, when spore contamination is likely (*B. Tetanus*, *B. Anthrax*, *B. Subtilis* and Hay Bacillus), in an ordinary steamer, on three successive days for a quarter to one hour. By this treatment, all bacilli present are killed on the first day; spores present may develop, and are killed on the second day; and the third day is to ensure absolute sterilization.

A single exposure of 15 minutes in an autoclave is sufficient to destroy all bacilli and spores, provided the steam pressure is at least two atmospheres, *i.e.* temperature 120°C . approximately, or 15 lbs. pressure on the gauge.

12. OINTMENTS.—May be sterilized by shaking melted ingredients, in a closed tin, until cold. Any ingredients, decomposed by heat, must be incorporated, in a sterile mortar, with the previously sterilized basis.

13. OPERATION AREA.—There are numerous methods, but the following is simple and effective: First shave the entire part, then wash with hot water and ether soap, dry carefully with sterile towel, swab over with Acetone or Ether. Apply a 2.5 per cent. solution of Iodine in Rectified Spirit, allow to dry and apply a sterile dressing until the operation is about to be commenced, when the Iodine should be painted on again. It is absolutely essential for the effective action of Iodine that the skin be dry.

Picric Acid, 8 per cent. in spirit, may be used in the place of Iodine.

14. SURGEON'S HANDS.—The Surgeon must always pay careful attention to his hands, keeping the skin and nails free

from any roughness. Before an operation, they should be scrubbed with soft soap and a stiff nail brush, for ten minutes, under a running stream of hot water.

Rubber gloves, which have been boiled, are then pulled on from a bowl of water, by holding the wrist-band of the glove only. On no account should the finger or any other part of the rubber glove be touched by the ungloved hand.

15. **PLASTERS.**—To sterilize a plaster mass, the ingredients may be heated separately, as far as possible. A germicide is then incorporated with the mass, which will not affect the skin when the spread plaster is applied.

16. **VULCANITE AND CELLULOID ARTICLES** should not be boiled, but may be sterilized with an antiseptic, preferably Formalin Vapour.

DRESSINGS

1. **STERILIZATION OF DRESSINGS**—*See above.*

2. ANTISEPTIC DRESSINGS

The following is the strength of the medicated lints, gauzes, and wools:—

Boric Lint (colour pink)	...	...	50 per cent.
Boric Wool (colour pink)	...	...	25 per cent.
Carbolic Acid	...	...	5 per cent.
Double Zinc Cyanide (colour violet)	...	...	3 per cent.
Iodoform	...	...	5 to 10 per cent.
Mercuric Chloride (Sublimate)	...	...	$\frac{1}{4}$ per cent.
Mercuric Iodide	...	...	5 per cent.
Picric Acid	...	...	$\frac{1}{4}$ per cent.
Salicylic Acid	...	...	5 per cent.
Sal. Alembroth (colour blue)	...	...	1 to 2 per cent.
Zinc Sulphate	...	...	5 per cent.

3. INSTRUCTIONS FOR THE PREPARATION OF DRESSINGS LOCALLY. IODOFORM OR BISMUTH GAUZE

Articles required:—

- (1) Iodoform, 2 dr. or Bismuth Subnitrate, 2 dr.
- (2) Gauze, nine yards.
- (3) Carbolic Lotion, 5 dr., strength 1 in 40.

(4) Sunlight Soap.

(5) Carbolic Soap.

(6) Two Basins :—

(a) Wash the gauze well in Sunlight Soap to remove all starch, and keep it rolled in one basin.

(b) In the second basin, Carbolic Soap is mixed with 5 oz. of Carbolic Lotion until a good lather is produced; add to this 1 oz. of Iodoform and mix well.

(c) Rub this mixture into the gauze, until the whole becomes yellow.

(d) Squeeze the lotion from the gauze, and add the remaining ounce of Iodoform and mix well, as before.

(e) Again saturate the gauze, until the whole is well coloured.

(f) Finally, the gauze is not squeezed, but allowed to dry in the shade, and will be ready for use in 12 hours.

BORIC LINT

Articles required.—

(1) Acid Boric, 1 lb.

(4) Hot water.

(2) Lint, 1 lb.

(5) Basins, two.

(3) Sunlight Soap, 1 cake.

Method of preparing :—

(1) Wash the lint well in plain water, squeeze it out, and keep it rolled in one basin.

(2) In the second basin, 4 oz. of Boric Acid is well mixed with a pint of water. Sunlight Soap is rubbed into this solution, until a good lather is produced.

(3) Add another 4 oz. of Boric Acid to the solution.

(4) Dip the lint in the solution until every part is well saturated, and then squeeze out the excess solution.

(5) Add 4 oz. more Boric Acid to the solution, and rub in more Sunlight Soap.

(6) Again saturate the lint and squeeze out.

(7) Finally, add the remaining 4 oz. of Boric Acid, and thoroughly saturate the lint,

- (8) Do not squeeze out, but allow to dry in the shade.
- (9) After ten hours, roll while still moist.

CYANIDE GAUZE

Make a solution of Double Cyanide of Mercury and Zinc, 3 per cent. by weight in distilled water. Immerse previously prepared and moistened gauze in the solution. Saturate thoroughly. Wring out excess of solution, dry and fold.

BINIODIDE GAUZE

Make a solution of Biniodide of Mercury 1 in 1,000, take the gauze, which has been previously prepared and moistened, and saturate it thoroughly with the solution, dry and fold in six layers.

ABSORBENT COTTON

1. Make a solution of Commercial Carbonate of Soda, 2 oz. in a gallon of water.
2. Take 2 lbs. of cleaned and ginned cotton.
3. Immerse the cotton in the solution, and heat slowly at the simmer for three hours.
4. Rinse the wool thoroughly in running water, until all alkali is removed.
5. Squeeze as dry as possible; spread out to dry in the shade.
6. Tease and card; store in dust-proof tins; sterilizing before use.

ACCESSORIES

LIGATURES

CATGUT.—14 sizes, namely, Nos. 000000, 00000, 0000, 000, 00, 0, 1, 2, 3, 4, 5, 6, 7 and 8.

The sizes generally used are numbers 00, 0, 1, 2, 3 and 4, the respective outside diameters of the gut being .014, .016, .018, .020, .024 and .028 inch.

SILK.—13 sizes, namely, Nos. 0000, 000, 00, 0, 1, 2, 3, 4, 4½, 5, 5½, 6 and 8.

THREAD (BARKER'S).—3 sizes, namely, No. 8 Black, No. 18 Yellow, No. 35 White.

SILKWORM GUT —This is supplied in 9 thicknesses:—

1 size, Very fine, Black for Ophthalmic work.

2 sizes, Fine Gossamer (for Intestinal work).

3 sizes, Ordinary Silkworm Gut, Fine, Medium and Strong.

3 sizes, ' Salmon Gut,' Stout, Extra Stout and Very Stout.

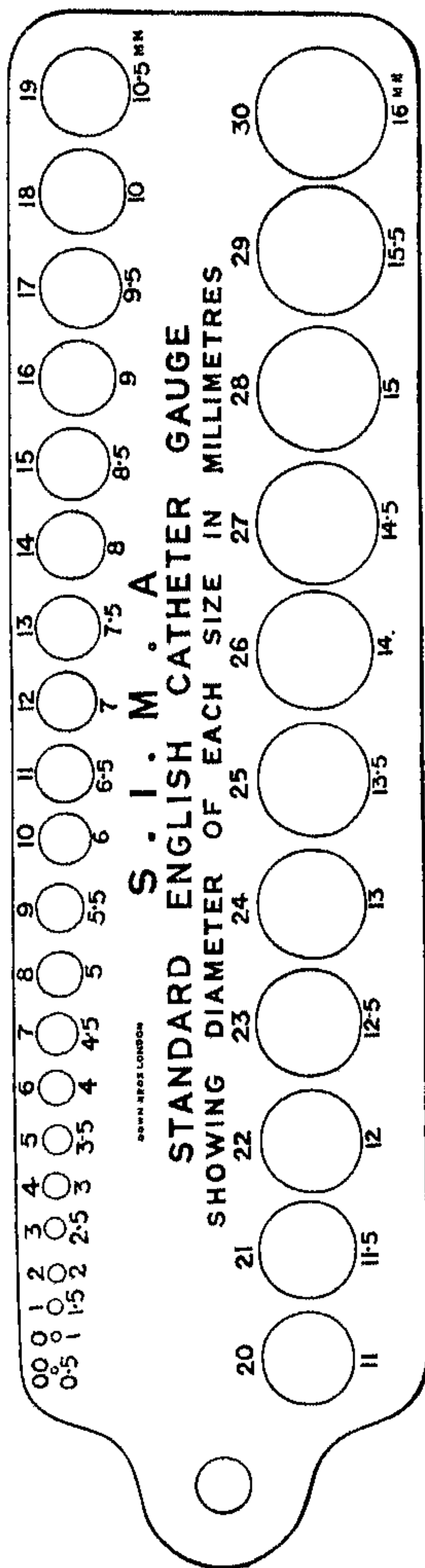
WIRE.—

Phosphor Bronze, 8 sizes.

Silver, 12 sizes.

Silver for patella or bone suture, extra large sizes:—Nos. 4, 5, 6 and 7 French gauge.

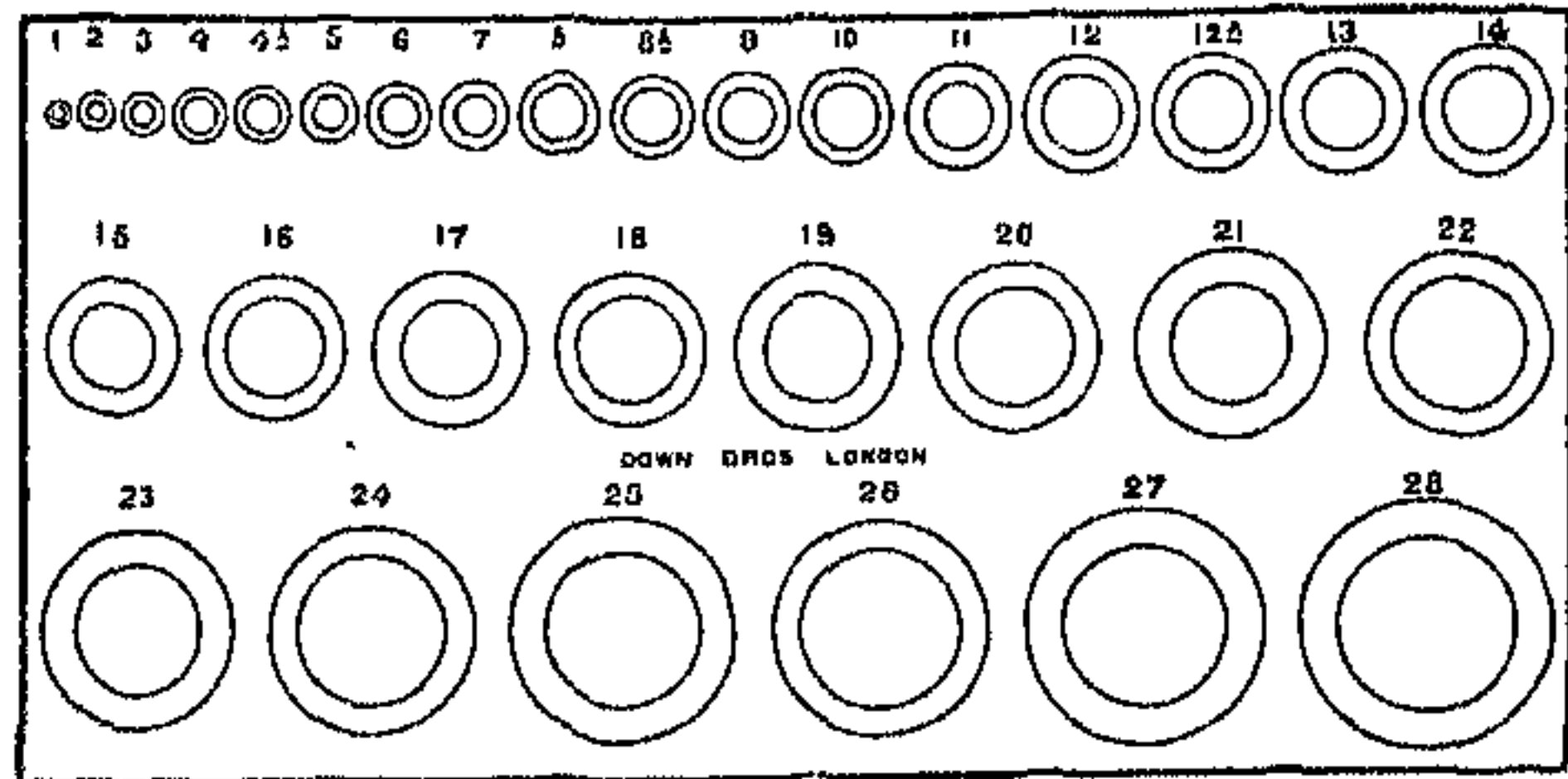
CATHETERS



The above illustrates a gauge showing the sizes of Catheters on the English standard, also the diameter in millimetres which multiplied by three gives the French gauge.

DRAINAGE TUBES

Red rubber, sizes Nos. 1 to 28.



The above illustration gives the different sizes and is approximately $\frac{1}{4}$ scale

The French gauge refers to circumferences in millimetres; thus No. 6 French gauge means 6 m.m. in circumference, or 2 m.m. in diameter. The new English gauge No. 2 size is 2 m.m. in diameter or 6 m.m. in circumference.

PESSARIES

Circular Pessaries are, generally speaking, made in sizes ranging from 2 ins., and, increasing by $\frac{1}{8}$ inch, to $3\frac{3}{8}$ ins., outside diameter, and are numbered from one to twelve.

The Hodge type of Pessary is measured at its greatest length, and made in sizes ranging from 2 ins., increasing by $\frac{1}{8}$ inch, to $3\frac{3}{8}$ ins., in length, and numbered from one to twelve.

The sizes and their corresponding numbers are as follows:—

Nos. ...	1	2	3	4	5	6	7	8	9	10	11	12
Sizes ...	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$ inches.

MANIPULATIVE SURGERY

This branch of Surgery which has lately received more attention, was practised in ancient times, it may be defined as the art and practice of moving joints for therapeutic reasons. Until recently it was neglected by the profession largely on account of its use being misunderstood and its association with 'bone-setting'.

This therapeutic manipulation is undertaken to improve or fully restore the normal movements of a joint, in those conditions which are amenable to this form of treatment; it would not of course be employed when there is mechanical obstruction from bone conditions as osteophytes and malunited fractures, or in the case of a tubercular joint when the disease is still active as manipulation in such a case far from doing good, would cause a flare up of the trouble. But with these exceptions inactivity has been too much favoured in the past and the rule should be—When in doubt Move.

As a rule when dealing with a painful joint if there is limitation of movements in all directions the case is one of arthritis. whereas pain with a free movement in some or perhaps all directions, suggests an extra-articular cause. In the early stages of a case, rigidity is due to protective muscular spasm, later secondary contractures of muscles will have developed. In order of incidence the loss of normal movement of a joint is due to: (1) Muscular spasm; (2) Adhesions either within the joint from synovitis or extra-articular; (3) Contraction of the surrounding tissues in adaptation to the altered conditions; (4) Changes in the joint surfaces and possible formation of osteophytes; (5) Ankylosis by fibrous tissue or bone.

The formation of adhesions should be prevented by early movements, these should be active by the patient rather than passive by the surgeon. Active movements should begin when the more acute symptoms have subsided, *i.e.* when the acute pain and tenderness have gone, and the swelling is decreasing. Early passive movements are not advisable, but after a fortnight are useful, and should consist of a single movement in each direction, the range if possible being increased daily. But if either active or passive movements cause—(1) Persistent pain, and (2) Daily decrease of movement—they must be immediately stopped and the joint rested, on the other hand increased mobility indicates the practice of more and more movement.

Before manipulation the joint should be treated with heat, hot sand-bags if no other method is available, for a week or ten days beforehand as heat softens the tissues. Full anaesthesia will be required if the patient is muscular and the adhesions

firm. Speaking generally the joint should be moved to its full range in all movements, and combinations of movements, with two exceptions—when there is great resistance, and in the case of the shoulder joint, in these cases the manipulation should be done in stages repeated at intervals of 7 to 14 days for 3 or 4 sittings.

In the case of the knee-joint effusion may occur after movement but should be disregarded, as it will disappear as the tone of the parts improves with exercise. In those cases where the resistance is gradually overcome by stretching, the prognosis is not so good as when manipulation results in definite snapping of adhesions. It should be made a general rule that no joint should be manipulated unless previously examined by X-rays, to exclude such conditions as advanced osteo-arthritis, gross bony obstruction, loose bodies in the joint, or joint disease all of which are unsuitable for manipulation. It must also be remembered, that there are cases of adhesions which are too firm to be dealt with by manipulation, such as occur after supuration (osteomyelitis); attempts to break these down by forcible movement would almost certainly result in fracture of the patella in the case of the knee, and the humerus in the case of the shoulder. Apart from injuries deformities such as club-foot call for manipulation in some part of the course of their treatment.

OPERATIONS

PREPARATION FOR, AFTER-TREATMENT OF, AND COMPLICATIONS OF

PREPARATION FOR OPERATIONS

1. PREPARATION OF THE PATIENT.—*See* Surgical Nursing.
2. STERILIZATION FOR OPERATION.—*See* above.
3. PREPARATION OF THE ROOM OR THEATRE.—*See* Surgical Nursing.

AFTER-TREATMENT OF OPERATIONS

1. THE ROOM.—This is important, especially for a long convalescence. It should be airy, cool, free from noise and odour of cooking, and, if possible, so arranged that the patient can look outside.

2. POSITION.—After one or two hours in the dorsal position, the patient is propped up with pillows, or put into Fowler's position by means of a bed-rest, and a bolster under the back of the thighs, fastened at each end to the head-post of the bed by a rope of newar. If the operation has been on the stomach or gall-bladder, the patient should be almost sitting.

3. SHOCK.—For Treatment, *see* Index of Treatment.

4. PAIN.—It often happens that some local cause irrespective of the operation is the cause, such as pressure of a pin, bandage, or splint. The latter are difficult to apply to an unconscious patient, and often require readjustment. If due to the operative procedure, it should be relieved fully by morphia; usually $\frac{1}{4}$ gr. is sufficient.

5. NAUSEA AND VOMITING.—Prevention is summed up in regular anæsthesia, proper preparation, avoidance of over-starvation, and absolute rest and quiet after the anæsthetic.

6. MOUTH.—The taste of the ether and sticky mucus are best removed by the patient rinsing the mouth with equal parts of glycerine and rose water, to which a little lemon juice is added.

Most scrupulous attention must be paid to cleaning the mouth and teeth. The teeth should be brushed three times daily, and a mouth-wash used after every feed. All fluid food should be sterilized, both before and after the operation.

7. FLATULENCE.—This may cause the greatest discomfort and pain, and to one who has not been through the ordeal, it is difficult to understand the intense suffering. It usually passes off with the opening of the bowels by Calomel. Before this, it may, however, be necessary to give a warm enema of the following:—

R Turpentine ..	...	...	...	℥ss to ℥j
Barley Water	...	...	...	℥vii to ℥xv

Also, Pituitary Extract, 1 c.c. hypodermically, or Eserine Sulphate, 1/100 gr.

The following enema is very useful:—

R Liq. Ammon. Fort. ...	...	...	...	℥j
Water	...	...	...	℥j

Caution.—It is to be used only once; never repeated, and never to be given stronger than above.

8. OPENING OF THE BOWELS.—This is most important. The best practice is to give Calomel, gr. 1, with or without Sod. Bicarb., gr. 5, every hour, until five or six doses have been given. The first dose should be given 24 to 30 hours after the operation.

Fourteen hours after the last dose, if the bowels have not been freely opened, give $\frac{1}{2}$ c.c. Pituitary Extract hypodermically, and, within half an hour, give an enema of a pint of soap and water, with or without an ounce of Castor Oil.

The following prescription may be given 12 to 14 hours after Calomel; but if there is much flatulence, it may tend to increase it:—

R Sod. Sulph.	...	...	...	℥ss
Mag. Sulph.	...	...	...	℥ii
Tr. Nux. Vom.	...	...	...	℥i
Aqua Menth. Pip. ad.	...	...	...	℥ii

for one dose.

If the bowels are still not freely open after further enemas, give:—

R Pituitary Extract	...	...	...	1 c.c.
Hyosine Hydrobromide	...	...	...	1/100 gr.
Normal Saline	...	...	...	to 4 c.c.

With a syringe directly into a vein.

This method, recommended by Col. Melville, has a most remarkably rapid action.

For the subsequent opening of the bowels, Paraffin may be given night and morning, but Senna Tea is preferable. About

20 senna pods are soaked in cold water for eight hours, and the resulting tea given in the early morning.

9. THIRST.—Sometimes, a patient goes on being sick until 4 to 6 oz. of hot water with ʒj of Sod. Bicarb. are given. As soon as the feeling of nausea has passed off, there should be no restriction as to the quantity of fluid given.

10. FOOD.—After 24 hours, soup, equal parts of milk and soda water, or milk and barley water, and jelly, grape and orange juice may be given: for Indian patients, dal water or barley water, diluted milk, grape, pomegranate or orange juice. Solid food should not, as a rule, be given for five to ten days, although this rule is often relaxed.

11. SLEEPLESSNESS.—The nurse should carefully arrange the patient and the bed, or gently massage the head and neck. Aspirin 10 gr., or Aspirin 5 gr. with either Medinal 5 gr. or Veronal 5 gr. with a hot drink. If due to severe pain, as after pile operations, Morphia, $\frac{1}{8}$ to $\frac{1}{4}$ gr., should be given. In old people who are very wakeful, a second dose may be necessary.

12. URINE.—An exact record should be kept of the amount of urine passed. If there is difficulty in passing, the catheter should be avoided, as long as possible, and fomentations used.

13. TIME DURING WHICH A PATIENT IS KEPT IN BED AND IN HOSPITAL.—The clips are usually removed in 4 to 5 days in the hot weather, and 5 to 6 days in the cold weather, and in children somewhat earlier, but in the hot weather, it is necessary to inspect the wound daily after the first 2 or 3 days. While, in England, it is possible to let the patient out of bed in 6 or 7 days, after a simple appendix operation, and out of hospital in 14 days, in India it is advisable to keep all abdominal and hernia operations in hospital for at least 21 days; otherwise, trouble with the deep suturing material is probable, as, apparently, it is absorbed with greater difficulty in that country than in colder climates. Metal clips for the skin and linen thread (kept on the boil during the operation) for the deep sutures should invariably be used.

14. (a) The CATHETER, after Symes and Wheelhouse operation, is usually removed on the 4th or 5th day, but in India it should be retained for 7 or 8 days, if there was no urethral discharge before the operation, the wound being lightly plugged.

(b) PROSTATECTOMY TUBE, $\frac{3}{4}$ in. in diameter, should be removed on the 4th day, the smaller tube from the space in front of the bladder being removed on 2nd day.

* (c) The TUBE, after removal of the sac in hydrocele operations, should be taken out at the end of 24 hours.

(d) The principles governing the POST-OPERATIVE CARE OF WOUNDS involving the rectum and anus are: Cleanliness, the least amount of interference with the wound, rest in the recumbent position, relief of pain, prompt recognition of and treatment of infection. The tubes for internal pile operations should be removed on the morning of the 5th day, after an injection of Olive Oil, when the bowels are opened for the first time.

(e) The PLUG in dressing fistula wounds, must be long and thick, the upper end being carried well up the rectum beyond the wound, and the lower end projecting outside the anus, the centre being pressed firmly to the bottom of the wound.

(f) The removal of an EMPYEMA TUBE will depend upon the amount of discharge and rapidity of closure of the cavity; in children, it can often be removed on the 10th day; in adults it is seldom possible before 6 weeks.

(g) In OPERATIONS ON JOINTS, the tube which goes down to, but not through, the sutured synovial membrane, should be removed as early as possible.

(h) TIGHT BANDAGE is essential after hernia operations.

See also Surgical Nursing.

SALINE TREATMENT

Subcutaneous, per rectum and intravenous. *See Minor Operations and Therapeutic Measures.*

TRANSFUSION WITH BLOOD OR GUM—*See Minor Operations and Therapeutic Measures.*

COMPLICATIONS AND SEQUELÆ OF OPERATIONS

1. ACID INTOXICATION.—Acetonuria appears as a profound intoxication, from 12 hours to 6 days after the anæsthesia, and is at times accompanied with incessant vomiting.

Treatment.—*Preventive* avoidance of undue starvation, water by mouth up to an hour before operation, with or without Glucose, or Sod. Bicarb. *See also General Anæsthesia.*

Curative.—*See Index of Treatment.* Morphia pushed to the physiologic effect has almost a specific action.

2. VOMITING.—*See General Anæsthesia.*

3. ACUTE DILATION OF THE STOMACH.—This occurs generally about 48 to 72 hours after operation, with pain in epigastrium, intense thirst and copious vomiting.

Treatment.—Nothing by mouth, frequent lavage of stomach, proctoclysis of plain water or 5 per cent. Glucose, intramuscular injection of Pituitrin.

4. CARDIAC FAILURE AND RESPIRATORY FAILURE.—Early in the operation they are the result of sudden shock, at the end or immediately after an operation a sign of collapse. Adopt prompt measures. First see that the air-way is free. Keep patient warm. Give morphia $\frac{1}{4}$ to $\frac{1}{2}$ gr., this is valuable especially if the pulse is irregular. Avoid strychnine, pituitrin and saline, the latter may cause œdema of the lungs. In extreme cases give Gum or Blood Transfusion. Raise the foot of the bed. The application of clothes wrung out of boiling water to the head often have a miraculous effect. *See also* General Anæsthesia.

5. DIABETES.—In emergency operations if there is no time to render the patient sugar free: give Insulin 30 units just before operating and $1\frac{1}{2}$ oz. of Glucose in water by the mouth.

After operation give an ordinary milk diet and 20 units of Insulin every six hours, testing the urine every six hours. *See also* Treatment of Diabetes in the Index of Treatment.

6. DELIRIUM TREMENS.—Is more common after fractures and other accidents. Treatment is essentially prophylactic by giving small doses of alcohol to chronic alcoholics from the time of admission and keeping the bowels open. For the treatment of the fully developed condition *see* Alcoholism.

7. GAS GANGRENE.—This very serious and fatal condition is fortunately rare in civil practice but common in war. Should there be any danger of this condition developing the wound should be left open and irrigated by the Carrel-Dakin method, and B. Welchii serum 66 c.c. given intramuscularly.

8. HÆMOPHILIA.—Only the most urgent operations should be performed in this condition. The surgeon should be on his guard as patients and their relatives seldom intimate the fact. In all serious emergencies in these patients Transfusion of Blood should be given. *See also* Hæmophilia in the Index of Treatment.

9. HÆMORRHAGE.—‘Reactionary’ occurs during the first 48 hours, from slipping of a ligature. There is no difficulty in diagnosing external hæmorrhage, but internal hæmorrhage as in the case of the chest or abdomen may be confused with post-

operative collapse. In hæmorrhage the pulse becomes more and more rapid with air hunger and restlessness, the abdomen being acutely tender.

Secondary hæmorrhage occurs in septic wounds after the tenth day and is usually preceded by slight initial hæmorrhage which should be a sign for keeping a tourniquet ready.

10. HEAT-STROKE.—This may occur during the later part of, or shortly after, an operation, in the hot weather, specially at night. The onset is sudden, and the surgeon at once becomes aware of the condition from the increased temperature of the part he is handling. It would appear to be more frequent in appendicitis than in other conditions. The operation must be rapidly completed with the minimum of anæsthetic, the patient at the same time being rubbed over with pieces of ice; a large enema of iced water and a hypodermic of strychnine given; and the heart carefully watched for signs of failure.

11. HICCOUGH.—This is of grave import in abdominal cases, especially if there is any evidence of chronic nephritis. *See Index of Treatment.*

12. PAROTITIS.—This is rare, but serious, and especially liable to follow operations on the pelvic organs.

Treatment.—The mouth should be kept very clean, and the patient encouraged to chew a crust of bread; and if the mouth is kept open during sleep, it should be covered by layers of gauze.

13. PERITONITIS.—With a pulse rate rising gradually from 120 to 140, or even higher, in the absence of lung complications, the existence of peritonitis may be confidently diagnosed. It should be treated by securing the freest action of the bowels, gastric lavage, Fowler's position and Saline per rectum.

14. PHLEBITIS AND THROMBOSIS.—This is of frequent occurrence, especially after operation on the uterus and its appendices, and the rectum. It develops in both clean and septic cases and is more frequent after the age of 30. The results depend upon the location of the thrombus, apart from the involvement of the portal vein, which is rare and produces symptoms of acute peritonitis. Clots in the veins of the pelvis or lower extremities produce no symptoms as long as they are not infected; if infected, there will be local tenderness and swelling, with chill and rise of temperature.

Treatment.—Absolute rest in bed for five or six weeks, the leg wrapped in cotton wool, and elevated with hot bottle to the foot. Locally, an ice-bag will relieve the pain; if severe, morphia hypodermically. *See also Index of Treatment,*

15. POST-OPERATIVE HÆMATEMESIS.—For treatment of Hæmatemesis *see* the Index of Treatment.

16. POST-OPERATIVE MANIA.—Is an infrequent but usually fatal complication more common in pregnant women, and after pelvic operations especially on the prostate, patients are usually suicidal and require careful watching.

17. POST-OPERATIVE PNEUMONIA.—The mouth should be kept clean, teeth being brushed twice daily, and all chills avoided. There is no definite onset and the disease does not run the course of an ordinary lobar pneumonia.

Treatment.—Absolute quiet, plenty of fresh air and water by the mouth; dry cupping is said to be very beneficial.

18. POST-OPERATIVE TETANUS.—The source of infection would appear to be either catgut, or faecal contamination of wounds that are in the region of the anus.

Treatment.—*See* Index of Treatment, Specific Therapy and Recent Advances in Medicine.

19. PULMONARY EMBOLISM.—Blocking of the pulmonary artery by a mass of clot, detached from a venous thrombus, is not uncommon, and generally occurs between the second and fourth week after operation; death may be sudden or a long respiratory struggle.

Treatment.—Little can be done, except to sit the patient upright, give plenty of fresh air or oxygen, and possibly a hypodermic of Atropine.

20. PULMONARY COLLAPSE, MASSIVE.—This usually occurs the day after operation, the patient complaining of tightness of the chest and upper abdomen. It may be the forerunner of other pulmonary complications, but usually clears up with counter-irritation of the phrenic nerve.

21. RETENTION OF URINE AND CYSTITIS.—Retention is most frequent in pile, perineal or pelvic operations.

If the patient has not passed urine at the end of 12 hours, hot bottle stupes or an enema should be tried, with a change of position. If these are ineffective, a catheter must be passed as over-distension will lead to suppressed renal activity. The catheterization must be carried out with great care, as the soil is fertile for septic infection.

22. SEPTICÆMIA.—Is more common when bone or joint wounds become infected; the focus of infection should be thoroughly dealt with and irrigated by the Carrel-Dakin method.

23. SHOCK.—For treatment *see* Index of Treatment.

- 24. SUB-PHRENIC ABSCESS.—*See* Index of Treatment

25. URÆMIA.—May develop at any time after operations on the urinary tract or in patients suffering from renal disease. It is usually preceded by suppression or the passage of large quantities of urine deficient in urea. *See* the treatment of Uræmia in the Index of Treatment.

DISEASES OF THE THROAT AND NOSE

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THE TECHNIQUE OF TREATMENT

In dealing with this branch of medicine, it may be useful to discuss and describe the several means by which local applications can be applied to the mucous membranes. A brief account is, therefore, given as an introductory.

THE GARGLE OR THROAT BATH.—This is used when it is intended that the medicated lotion should reach the lower part of the pharynx, or the base of the tongue. It should be as hot as the patient can tolerate.

THE NASAL DOUCHE.—This consists of directing, by gentle pressure, a stream of lotion through the nasal passages. There are several instruments that can be used for this purpose, but the best is probably the boat-shaped glass especially made for the purpose, or an ordinary Higginson's syringe. The patient holds his head bent forward over a basin, with his mouth open, and breathes rapidly in and out through it. He fixes the cannula, or nozzle, inside the nostril; the end must be placed parallel to the nasal passage. The jet of liquid will thus run backwards following the nasal parietes, and not upwards towards the olfactory region and the cribriform plate, which would give rise to unpleasant sensations. Should one of the nostrils be more obstructed than the other, the cannula must be placed in the narrow side.

THE SPRAY.—Sprays may be hot or cold:—

- (a) The cold spray may be carried out with an atomizer, of which there are several patterns, but the De Vilbiss is a very convenient one. There are two types, the one gives a fine spray and the other a coarse one.
- (b) The hot spray requires a special apparatus, which throws a jet of steam, laden with some medicated substance, into the throat or nose.

INHALATIONS.—These consist of inhaling slowly the steam from hot water which has been medicated or aromatized with some volatile substance. The prescribed drug is put into a wide-mouthed vessel containing boiling water, and the mixture gently shaken. The fumes emitted are collected by a funnel, or by a

towel rolled into the shape of one, the wide end being applied to the vessel and the narrow one around the mouth or nostrils, or both.

PAINTING.—This is best done by means of a piece of cotton-wool teased out and wrapped tightly round a metal probe. After being prepared, the swab is dipped into the prescribed solution, squeezed out slightly, to prevent the liquid falling into the hypopharynx or the trachea, and then, under the control of the eye, painted over the affected parts. The practitioner must carry out the painting with dexterity, for, though the painting must be energetic, to obtain an efficient therapeutic action, and as slight a reflex as possible, it must never be rough.

In place of a nasal spray it is sometimes more convenient—especially in cases of children—for the patient to apply the treatment to the interior of the nose by painting with a small brush. The same result can be achieved by the use of ointments, which can be put in the nostrils, in which it melts and passes along the nasal cavities. In prescribing an ointment, it is usual to use Vaseline as a basis, but in warm climates Lanoline is preferable. It should be put up in metal tubes, as it makes the introduction easier.

Painting the larynx requires the co-operation of the patient, who holds his own tongue between the thumb and index finger of his left hand, the thumb being placed on the under surface. The operator, having previously adjusted his forehead mirror and light, holds the laryngeal mirror in his left hand and directs a curved cotton holder, saturated with the appropriate solution, into the pharynx with his right hand, passing it round the base of the tongue, then over the epiglottis until it enters the larynx, watching the direction all the time. It is usually necessary to cocaineize the dorsum of the tongue and epiglottis first with a 5 per cent. solution. This can be done with a laryngeal spray.

INSUFFLATION.—This is a method seldom used for the application of drugs to the nasal mucosa, but it is of great value in laryngeal cases. Either an insufflator, with a curved vulcanite end, can be used, or the patient can be taught to inhale the drug, in the form of powder, through a Le Due Tube, which is simply a glass tube suitably bent to permit one end passing over the base of the tongue. A small quantity of the powder is placed in the other end, and by a sudden inspiration, it is drawn into the larynx.

ACUTE TONSILLITIS.—The first step in the treatment of any case of acute tonsillitis is the bacteriological examination of a swab. Remember that many systemic diseases have the

local manifestation of tonsillitis. Should the patient be seen at the beginning of the attack, paint the tonsils thoroughly with:—

Cocain. hydrochl.	...	...	gr. iiss
Zinc. Chlorid.	...	...	gr. xv
Acid hydrochl.	..	...	m ss
Glycerine	...	...	ʒiij
Aq. distil. ad.	.	..	ʒi

If this does not arrest the disease, it is not advisable to repeat the application but rather to use a soothing gargle, such as:—

Sod. benzoat.	...	...	ʒiiss
Sod. bromid.	...	..	ʒiiss
Phenazon.	...	...	ʒiiss
Spirit menth. pip.	...	..	m xxx
Glycerine ad.	..	..	ʒiv

Sig. One teaspoonful in half a glass of warm water, or the following:—

Sodii Bicarbonatis	...	...	gr. 60
Liq. Thymol Co. (B.P.C.)	...	...	ʒij
Glycerine	...	...	ʒij

Sig. A tablespoonful in half a glass of hot water.

Attention must, of course, be paid to the general health and a light diet prescribed.

PERITONSILLAR ABSCESS.—This is usually associated with more severe constitutional symptoms than acute tonsillitis and the patient has considerably more pain.

In Early Stages, Calomel, $\frac{1}{8}$ gr., every hour for six hours, often cuts short an attack. Pulv. Ipecac Co. (Dover's Powder), gr. x, should be given at night and hot fomentations to the neck are most soothing. Much stringy mucus is apt to accumulate in the mouth. A mouth-wash of Hydrogen Peroxide (10 vols.), ʒi in a glass of hot water, is useful in relieving it. Inhalations of Tr. Benzoin Co., ʒss in a pint of boiling water, is very soothing.

The Second Stage starts with the formation of an abscess. The patient's suffering is great, and an attempt should be made to open the abscess. Remember the site of puncture, which is above and to the outer side of the tonsil. On no account must a general anæsthetic be administered. Many deaths have occurred by so doing. As a rule, the area of incision can be sufficiently anæsthetized by painting Meckel's Ganglion with Cocaine Hydrochloride 10 per cent. This is done by passing a cotton-tipped probe, soaked with the solution, through the lower part of the nasal cavity on the affected

side, in a slightly upward direction, until it is felt to touch the naso-pharynx. It is then moved as far laterally as it is possible to go. In 10 or 15 minutes the soft palate is sufficiently anæsthetic to permit of the abscess being opened without much discomfort. The relief is immediate if pus is found.

The Third Stage requires no particular management beyond the restoration of the patient's general health.

ULCERO-MEMBRANOUS TONSILLITIS (VINCENT'S ANGINA).—This is characterized by the appearance of a grayish membranous coating of a diphtheroid type, pulpy and irregular in shape, not only covering the tonsils, but spreading to the posterior pillars and part of the soft palate. The exudate lies upon a red and inflamed surface. The angina is often accompanied by a stomatitis of the same nature on the mucous membrane of the cheek, the outer margin of the tongue and more especially on the gums, close to the wisdom teeth. The breath is unpleasant, and there may be severe constitutional symptoms, but they are usually absent. Thorough cleansing of the mouth with Hydrogen Peroxide and Borax is important, after which paint the affected area with:—

Liq. Arsenicalis	...	...	...	ʒi
Vin. Ipecacuanhæ	...	...	...	ʒi
Spirit Rectificati	...	...	...	ʒi

or the following:—

Neosalvarsan	...	...	50 centigramm
Aqua ad.	...	...	8 cub. cm.

Attention to the gums is most important, or a relapse is likely to follow.

CHRONIC TONSILLITIS.—Complete removal of the tonsils by dissection in the case of adults, and by the reverse guillotine method in children, is the ideal treatment. Where this is not practicable, one of the following prescriptions can be tried:—

R Iodi.	...	...	...	gr. 6
Potassii Iodidi	...	...	...	gr. 25
Ol. Menthæ Piperitæ	...	...	...	m 10
Glycerinum ad.	...	...	...	ʒi
R Resorcin.	ʒiiss	R Argent. Nit.	gr. 10	
Spirit. anisi	m 10	(Glycerine ad.	ʒi	
Glycerine ad.	ʒiv			

- It should be painted on the tonsils night and morning. This treatment, together with a change of air and attention to the general health, is frequently rewarded by beneficial results, especially in children.

ACUTE PHARYNGITIS.—This is usually associated with an acute rhinitis, and sometimes with an acute laryngitis, in the malady known as a 'cold'. For the dry burning sensation of the early stages, inhalations of either of the following may be relied on to give relief:—

R Tr. Benzoin Co., ʒss in a pint of boiling water.

R Ol. Pini Sylvestris	...	...	℥ 40
Mag. Carb. Levis	..	...	gr. 20
Aqua ad.	...	...	ʒi

Using ʒi in a pint of boiling water.

The following used in as spray is excellent:—

R Menthol	...	...	gr. 6
Acidi Benzoici	...	...	gr. 3
Paraffinum Liquidum ad.	...	...	ʒi

and should be accompanied by either of the following mixtures:—

R Vin. Antimonialis	...	...	ʒii
Vin. Ipecacuanhæ	...	...	ʒii
Syr. Aurantii	...	...	ʒiv
Aq. Cinnamoni ad.	...	...	ʒvi

One tablespoonful in water every four hours.

or

R Liq. Strychninæ Hydrochloridi	...	ʒi
Liq. Ferri Perchloridi	...	ʒii
Liq. Hydrargyri Perchloridi	...	ʒiii
Glycerini	...	ʒiv
Aquam Destillatam ad.	...	ʒvi

One tablespoonful in water every four hours.

The latter is especially useful in acute streptococcal pharyngitis.

CHRONIC PHARYNGITIS.—A careful examination of the nose and nasal accessory sinuses is essential. Also, the general health should be investigated, as Chronic Pharyngitis is seldom a primary disease. Any condition found should be treated, and locally the parts may be painted with:—

R Iodi	...	...	gr. 6
Potassii Iodidi	...	...	gr. 20
Ol. Menthæ Piperitæ	...	...	℥ 5
Glycerini	...	...	ʒi

LUPUS OF THE PALATE AND PHARYNX.—This is sometimes met with. While the general health is receiving attention the ulcers may be painted with:—

R Acid. Lactic (B.P.)

and if deglutition is painful—

R Pulv. Orthoformi } Equal parts,
Pulv. Resorcini }

may be blown on the ulcer.

NOSE AND NASAL SINUSES

DERMATITIS OF THE NASAL VESTIBULE.—This is an uncomfortable malady. Do not mistake it for syphilitic ulceration or for the excoriation of nasal Diphtheria or sinus suppuration.

Either of the following will prove useful:—

R Acidi Salicylici	gr. 5	R Ung. Hydrargyri Nitratis	3i
Sulphuris Præcipitati	gr. 5	Paraffini Mollis Flavi	3i
Paraffinum Mollis Album ad.	3j		

FURUNCULOSIS.—This is painful affliction and one not without danger to life. Take it seriously. *Erysipelas of the Face and Cavernous Sinus Thrombosis* have both been known to take origin in such a simple lesion.

The vestibule should be frequently packed with cotton wool soaked in Hydrogen Peroxide 10 vols., and, for the pain, hot Gly. Acid. Carbol., 5 per cent., may be applied in the same way.

NASAL ACCESSORY SINUS DISEASE

ACUTE SINUSITIS.—This is usually associated with an acute coryza or an attack of influenza. All, or any, of the sinuses may be involved. The symptom most suggestive of sinus infection is pain. It is usually referred to the region of the sinus involved—supra-orbital, in case of frontal sinusitis; behind, and between, the eyes, in ethmoidal infection; the cheek bone, in antral suppuration, easily mistaken for toothache, and the occiput, in sphenoidal suppuration.

The treatment during the acute stage is the same in all. Inhalations of:—

R Tr. Benzoin Co.	3ss	R Oil of Eucalyptus	m 20
In a pint of boiling water.		Light Carb. Magnesium	gr. 10
		Water ad.	3i
or			
R Menthol	gr. 16	R Thymol	gr. 5
Rectified Spirit	3ii	Rectified Spirit	3i
Light Carb. Magnesium	gr. 8	Light Carb. Magnesium	gr. 8
Water	3i	Water ad.	3i

Sig. 3i in the pint of boiling water in each case;

and followed by a spray of:—

Adrenalin Hydrochlor. (in 1,000) ... ʒiiss
 Cocaine Hydrochlor. ($\frac{1}{2}$ per cent.) ad. ... ʒi
 Using not more than 15 to 20 m at a time.

or

R Menthol	gr. 5	R Cocaine Hydrochlor.	gr. 2
Cocaine	gr. 5	Camphoræ	gr. 1
Oleic Acid	m 15	Ol. Rose Geranium	m 2
Liquid Paraffin ad.	ʒi	Liq. Albolene ad.	ʒi

Aspirin, gr. x to gr. xv every 4 hours, or Pulv. Ipecac Co., gr. x if necessary, will usually relieve the pain.

When the discharge becomes more free, the nasal passages may be douched with one of the following:—

R Sodii Bicarbonatis	ʒi	R Sod. Bicarb.	gr. 3
Sodii Biboratis	ʒi	Borax	gr. 3
Sodii Chloridi	ʒij	Acid Carbolie	gr. 1
Sig. ʒi in a pint of water.		White Sugar	gr. 5
		Water ad.	ʒi
		Sig. In an equal quantity of hot water.	

If the middle turbinate bone is large, it may be advisable to remove its anterior end under cocaine, and in the case of Antral Suppuration, it may be necessary to wash the cavity out through a trocar and cannula. Generally speaking, it is not advisable to do any further operative treatment during the acute stage.

CHRONIC SINUSITIS.—The treatment of all chronic sinus infection is operative. Where this, for any reason, is not practicable, any of the following nasal washes may be relied upon to alleviate the symptoms:—

R Ammon. Chloride	gr. 5	R Sod. Bicarb.	gr. 8
Sod. Chloride	gr. 3	Boracic	gr. 8
White Sugar	gr. 5	Sod. Benzoatis	gr. 1
Water ad.	ʒi	Sod. Salicylas	gr. 1
		Eucalyptol	m 1
R Tr. Benzoin Co.	m 5	Thymol	gr. 1
Borax	gr. 5	Menthol	gr. 1/12
White Sugar	gr. 5	Ol. Gaultheriæ	m 1/12
Water ad.	ʒi		
R Hazelin	m 20	R Sod. Bicarb.	gr. 8
Borax	gr. 5	Borax	gr. 8
Glycerine	m 5	Sod. Benzoate	gr. 1
Water ad.	ʒi	Eucalyptol	m 1/12
		Menthol	gr. 1/12
		Water ad.	

Each of the foregoing are double strength and should be used with an equal quantity of hot water.

* **ATROPHIC RHINITIS.**—This is a distressing condition, which, if untreated, renders the sufferer a social out-cast on account of the nauseating odour that is associated with the disease. The patient should be instructed to cleanse the nose daily, with a warm alkaline douche. To facilitate the expulsion of the crusts, each nostril should be tightly plugged with cotton wool for half an hour before douching. After all crusts have been removed, paint the interior of the nose with:—

R Glucosa Anhydrosi Puri	...	...	...	℥iv
Glycerini	...	...	...	℥iss

An operation, which consists of moving the lateral nasal wall medially, with the object of narrowing the nasal passages, has recently met with considerable success.

HYPERTROPHIC RHINITIS.—This is best treated by the reduction of the size of the inferior turbinate with the electric cautery. Purgation and a restricted diet is helpful.

LARYNGITIS.—

ACUTE.—Remember the possibility of Diphtheria. The patient should be confined to bed, or at least indoors, and absolute rest to the voice should be enjoined.

The inhalation of steam, impregnated with either of the following, is indicated:—

R Tr. Benzoin Co., ʒss to ʒi in a pint of boiling water.

or

R Oil Pini Sylvestris	m 40	R Terobene, pure	m 40
Light Carb. Magnesium	gr. 20	Light Carb. Magnesium	gr. 20
Water ad.	ʒi	Distilled Water ad.	ʒi
Sig. ʒi in the pint of boiling water.		Sig. ʒi in the pint of boiling water.	

Hot lemon drinks, and hot fomentations to the neck, are comforting. If cough is a troublesome symptom, give:—

R Diamorphinum (Heroin) Hydrochloridi	...	gr. 1
Spirit. Chloroformi	...	ʒi
Tinct. Cocci	...	m 25
Syr. Amantii	...	ʒi
Aq. Amantii Flor. ad.	...	ʒiss

Sig. 20 to 60 minims a day.

In the case of a child, an emetic does good, especially when respiratory embarrassment is present. Use Vin. Ipecac., ʒi to ʒii.

CHRONIC.—An exact diagnosis is most important. Remember that chronic laryngitis is but one of the causes of hoarse-

ness. Growth, tubercle, syphilis and paralysis of the vocal cords must all be excluded. Rest to the voice by silence, or whisper, is imperative. Restriction of the amount of alcohol consumed, and tobacco smoked, must be insisted on, if indulged in to excess. Any defective methods of voice production and any existing infection in the mouth or upper air passages must be removed. Certain mineral waters, such as Mont Dore and Royat, are beneficial.

R Argylol gr. xv
 Aq. Destil. ad. 5i

may be applied locally by a means of a laryngeal spray.

TUBERCULOSIS OF THE LARYNX.—The prognosis is almost entirely that of the associated lung condition.

If the patient appears to be resisting the infection effectually, absolute silence, together with a sedative to allay cough, should result in a cure in early cases.

Local applications are not desirable, but if there are exuberant granulations, an application of Ac. Lactic. (B.P.), or the electro-cautery, will help.

In later cases, when ulceration is extensive, and the patient's chief complaint is dysphagia, use one of the following, in a laryngeal insufflator:—

R Pulv. Orthoform.			
or			
R Phenazon	...	...	gr. xc
Cycloform	...	...	gr. xc
R Morphin. Hydrochlor.	gr. v	R Orthoform.	gr. xx
Cocaine Hydrochlor.	gr. xii	Chloreton	gr. xl
Menthol	gr. iii	Iodoform.	gr. xc
Orthoform	gr. xc	Sacchar. Lact.	gr. xc
Tragacanth.	gr. xc	Acid Borici	gr. xc

Tracheotomy, as a means of putting the larynx at rest, may have to be considered. Some good results have been recorded.

SYPHILITIC ULCERATION OF THE LARYNX.—This requires no local treatment beyond the general buccal hygiene, which should be carried out in all ulcerative conditions of the upper respiratory tracts, and possibly, the insufflation of one of the foregoing analgesic powders, a quarter of an hour before meal times. Systemic treatment should, of course, be started at the earliest possible opportunity.

LARYNGEAL CARCINOMA

Carcinoma of the larynx may be either Intrinsic or Extrinsic

- The treatment depends upon the extent and position of the growth.

INTRINSIC CARCINOMA can be treated by operative measures—Laryngo-fissure, removal of the affected vocal cord. This gives very satisfactory results when the growth is confined to the cord.

Radium also gives good results in Intrinsic Carcinoma.

EXTRINSIC CARCINOMA does not respond so well to treatment which may be by operative measures—complete Laryngectomy, or by radium.

CARCINOMA OF THE ŒSOPHAGUS

Relief of symptoms has been obtained for varying periods up to 18–24 months by implantation of RADON SEEDS into the growth through the Œsophagoscope. Otherwise the patient will eventually need a gastrostomy.

THE MODERN TREATMENT OF VENEREAL DISEASES

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Although the main purpose of this article is to give a brief résumé of the treatment of gonorrhœa, soft chancre and syphilis which I have personally found to afford me the best results, I should like first to stress the value of a laboratory training to anyone proposing to specialize in this branch of medicine. A very short study of the subject must demonstrate clearly to anyone our dependance for success in diagnosis and treatment on a thorough knowledge of the pathological and immunological processes at work in a patient suffering from gonorrhœa or syphilis. Anyone who disregards such knowledge, working by rule of thumb and practising this, that, or the other form of treatment merely because someone he considers to be an authority on the subject has recommended it, must sooner or later find himself in difficulties over some problem for which he can find no answer in the literature. On the other hand the clinician who has prepared himself for work in this branch of medicine by a preliminary training in the laboratory not only learns the value and the limitations of the various tests which the pathologist will carry out for him but he learns to sift evidence and also in the atmosphere of the laboratory is sure to direct his mind to the pathological processes at work and to the principles on which those processes are to be combated. The published article on any branch of this subject then becomes not something to be followed blindly but evidence to be sifted and to be used only if it propounds a principle or a technique which is judged to be sound in the light of one's conception of the process by which the fight between tissues and micro-organism is waged. For these reasons when I am entrusted with the training of a specialist in venereal diseases I send him first to the laboratory to study the pathology of these diseases and to learn for himself the serum tests for syphilis, staining and microscopy and cultivation of the gonococcus.

It might be said that the above is self-evident, but the abundance of rule-of-thumb clinicians blindly following the practice of their favourite teachers shows that it is a truth which requires frequent repetition.

These remarks may perhaps serve to correct any impression of dogmatism which might otherwise be derived from the following on the actual management of gonorrhœa, soft chancre and syphilis.

GONORRHOEA

Probably most workers in this field would agree that the longer they have striven with the problem of evolving a sound treatment of gonorrhoea the more they have become convinced of the prime importance of two principles to be observed, namely the maintenance of efficient drainage and the stimulation of an adequate resistance to the gonococcus. There is nothing new in the principle that efficient drainage is essential to the cure of a microbial infection, and its importance in gonorrhoea has been recognized for a number of years, though it still seems often to be overlooked by some who attempt to stem the flow of purulent discharge in the acute stages by applying strong astringents, and in the later stages, instead of searching for and concentrating their treatment on those parts of the urogenital tract where colonies of gonococci are more or less locked up below the surface, trying blindly the passage of sounds, massage of the prostate, courses of vaccines and other methods they have read of as being good for chronic gonorrhoea, without any definite idea of what any of these things is doing for the particular patient. The importance of resistance has been recognized in a general way, but the difficulty has been to gauge it. For example, those who treat gonorrhoea rationally know that it does not pay to bludgeon the tissues with chemicals that damage them without destroying the deeply placed gonococci and that the patient must not do things which tend to lower his general fitness. It has often been noted, also, that such a complication as epididymitis or a peri-urethral abscess has brought an attack of gonorrhoea abruptly to an end, and it has been supposed that the complication must have generated such a large production of antibody as to annihilate the micro-organisms. But, except for the observation that the strength of the complement fixation reaction with a gonococcal antigen is commonly raised by a complication of gonorrhoea, it has not been generally recognized that this test is a practical gauge of the patient's resistance. D. Thomson, when working at the Military Hospital, Rochester Row, during the war, found that, coincidentally with the clinical improvement of a refractory case under well-regulated vaccine treatment, the titre of the complement fixation reaction rose. More recently P. A. Clements, investigating at the V.D. Department, St. Thomas' Hospital, the effects of a special vaccine prepared by J. Oliver on the principles elaborated some years ago by Diamond, has confirmed this observation. He has found that in many intractable cases of gonorrhoea, cases mostly with a very slight discharge containing gonococci in which the disease has persisted for months in spite of careful treatment, the complement fixation reaction has been negative or only doubtful, and that when the administration of the special vaccine has been followed by a marked

twice. With regard to the use of a syringe, although it seems to have the advantage of greater secrecy, it has disadvantages the chief of which seems to me that it does not wash the urethral wall efficiently. It may be argued that a disadvantage may be compensated for by the fact that it permits the use, in economical amounts, of remedies which are more penetrating and destructive of the gonococcus than those commonly employed in irrigation. Experience has shown that reliance on local remedies to reach down and destroy the gonococcus in the depths of the mucous membrane has so far led only to disappointment; the fact that the use of silver preparations that have been elaborated and commended at one time or another for the cure of gonorrhea is now over forty-five is a sufficient commentary on the results of this method of attack. Syringing may, however, properly supplement irrigation when this can be carried out only once a day, and in such cases I commonly prescribe one-eighth per cent. protargol, 8 to 10 c.c. to be introduced three times a day with a Canny Ryall type of syringe. This is a blunt-nozzled syringe holding in the glass portion about 10 c.c. and operated by a rubber bulb, which the average patient seems able to manipulate more easily than a piston. The urethra is irrigated three times at each sitting with the protargol lotion, which is held in for $\frac{1}{2}$, $\frac{1}{2}$ and 1 minute respectively; longer retention seems, according to Lomholt's investigations, to offer no advantages. Naturally the patient should be taught the art of using a syringe before he is entrusted with one, and should learn also how to keep it aseptic. With regard to general treatment, regular hours, mild, unspiced food, and abstinence from alcohol and spiced drinks are essential. Medicines are not really necessary in the majority of cases, but a sedative diuretic with belladonna in it seems to be useful in allaying spasm. With regard to vaccine treatment, I prefer now to wait until the symptoms have abated, regarding the vaccine as a mild spur to be used when the tissues appear to be flagging in their efforts to throw out the gonococcus. If and when the symptoms have subsided down to a morning gleet with clear urine containing heavy threads and the patient seems to be making no further progress towards recovery, it is essential to make a thorough and detailed examination to discover the cause. It lies in defective resistance or/and in one or more badly draining foci. The blood is tested for the complement fixation reaction, and if this is not found to be strongly positive, vaccine treatment is instituted. It is impossible to give precise directions for the administration of vaccine because so much depends on the make of vaccine employed; moreover patients vary greatly in their response. Generally, however, I believe that the intra-cutaneous route is better, and I would start with a very small

increase in the strength of the reaction to strongly positive symptoms and gonococci have disappeared; conversely if the reaction has not increased in strength the disease soundly remained. Here it may be mentioned that I have obtained cases of chronic gonorrhoea with negative complement fixation reactions after courses of ordinary gonococcal vaccine, and in this an explanation of the difference of opinion on the value of the vaccine treatment of gonorrhoea. The gonococcal complement fixation test shows that gonococcal vaccines differ considerably in antigenic power and also that patients differ in response; a given vaccine may fail to raise the titre in one case while another may fail in some but succeed in others. The value of the C.F.T. lies in the fact that, and one can judge much more quickly than by observation of clinical effects whether or not a vaccine is effecting its purpose. As in a number of cases studied in the investigation just mentioned it has been found that, when the complement fixation reaction was strong but the disease persisted, one could be practically certain that the sole requirement for cure was the dissection and treatment of badly draining foci.

In acute gonorrhoea of males it is generally agreed by British workers that there is little to be done at first besides washing the urethra twice daily with a mild lotion and that this is better done with an irrigator than with a syringe, provided that the irrigator is placed no higher than 3 to 3½ ft. above the urethra. Formerly, it was commonly taught that the irrigator should be placed about 5 feet above the urethra. I feel sure that this is much higher than is necessary and that the pressure of lotion at such a height is apt to over-distend and irritate the inflamed urethra. Moreover when one aims to get the lotion to flow into the bladder such a pressure is apt to defeat one's object by producing a spasm of the compressor urethra. Personally I rather believe in allowing the lotion to flow into the bladder as soon as the patient has acquired the knack of relaxing the compressor urethra. Many workers think that such a practice is apt to provoke complications in the form of prostatitis or epididymitis. In my experience it does not do so if the pressure is regularly greater than that suggested above and the lotion is weak and non-irritating. On the other hand, it has the advantage of washing the urethra more thoroughly than can be done by confining the irrigation to the anterior urethra. As to the nature of the lotion, potassium permanganate, 1 in 12,000 to 1 in 8,000, is as useful as any and better than most for average cases, but, as changes, acriflavine (1 in 5,000), mercuric bichloride (1 in 2,000 to 1 in 1,000), mercury oxycyanide (1 in 8,000 to 1 in 20,000), protargol (1 in 1,000) and silver nitrate (1 in 20,000 to 1 in 10,000) may be found useful. Irrigation should be continued twelve hours, more frequently seems better.

say, 10 millions, which is increased by about 50 per cent. at intervals of 3 to 4 days until a definite reaction occurs in the form of a well-marked area of irritation round the site of the injection, a rise of temperature to 99°F . or perhaps 100°F . and a slight increase in urethral discharge. Thereafter I would give the vaccine once a week, increasing the dose in a way which I calculate is likely to provoke such reactions as the above. The blood is tested after two or three weeks, and if the C.F.T. has not increased in strength I consider it as an indication for changing the vaccine or its method of administration. Many workers prescribe vaccine in much larger doses than these and claim good results from this practice. Personally I have tried it and concluded that it is apt to depress the resistance and precipitate complications, thus materially prolonging the attack. In their work with a new vaccine at the Royal Herbert Hospital Woolwich, some years ago, Dimond and Lambkin used at first an autolysate of gonococci as a final test of cure in cases where all other tests had failed to unearth the gonococcus. In cases where a buried focus still remained in the region of the urethra the effect of injecting this product into the urethra was a relapse with urethral discharge containing gonococci, and the inconvenient sequel was that the relapse was now particularly difficult to cure. So much so that the use of gonococcal autolysate as a test of cure was abandoned. In the early days of an investigation of Dimond's vaccine which has now been proceeding for some years at St. Thomas' Hospital the effect of the vaccine was at first bad, and this appears to have been due to inclusion in the vaccine of gonococcal autolysate; at any rate since the vaccine has been prepared with particular care to exclude this autolysate such inconvenient effects of the vaccine have not been seen. From this it seems reasonable to suppose that in a vaccine made in the ordinary way by suspending gonococci in saline there may be at least two important ingredients, autolysate which is depressing and another which is antigenic, and that the administration of too large a dose may bring too much into action the depressing factor. As mentioned above, in many cases treated with ordinary gonococcal vaccine the effect on the complement fixation reaction appears to be nil, and when this occurs there is no point in continuing to use that particular brand. It seems likely that when the practice of gauging the effect of a gonococcal vaccine by means of the C.F.T. becomes more general improvements in the selection of strains for use in such vaccines will follow, and that then the vaccine therapy of gonorrhoea will be much more helpful than it is at present.

The search for the badly draining focus can be very tedious. The first essential is to discover if the trouble is confined to the anterior urethra, and, to determine this, the anterior urethra

should be washed out thoroughly before the specimen of urine is taken. If this specimen is perfectly clear and threadless, and the prostatic and vesicular fluids are found to be free from pathological elements, one can concentrate on the anterior urethra with reasonable certainty of discovering the defect. Shrewd palpation of the urethra is valuable as it may disclose abnormal thickenings which can be investigated more thoroughly later with the urethroscopie. Naturally a careful search for para-urethral canals is necessary, and the urethroscopic examination must be very searching as some foci can be very small and innocent-looking. When any focus is found I open it with the electric cautery, being afraid of using a knife in aro-urethroscopy because of the risk of air embolus. The opening is followed by systematic dilatation, at intervals of 5 to 7 days, with a Kollmanu dilator. If the prostate and/or vesicles are at fault, periodical massage is best supplemented by diathermy applied to this part through the rectum with a suitable electrode, the neutral pad being on the abdominal wall.

In the treatment of gonorrhoea in females similar principles are observed. Drainage is helped by douching the urethra and vagina daily and by insertion into the vagina of a dressing of gauze soaked in glycerine medicated with some mild antiseptic; a yard of gauze folded lengthwise in four is a suitable size for the dressing, and it is paid off into the upper part of the vagina leaving a tag outside for ease of removal next morning. In cases where the patient finds it impossible to attend frequently for treatment on these lines I have found that the application of 10 per cent. freshly prepared mercurochrome-220 every 5 to 7 days is very useful. The vagina and cervical canal are first thoroughly cleansed by swabbing and then an urethroscopic swab soaked in the mercurochrome is inserted into the cervix. It is left there whilst the vagina is painted down with mercurochrome and then a fresh swab is inserted into the cervical canal and left there for a few minutes. In a recent article on the use of mercurochrome in gonorrhoea of females R. S. Statham¹ deprecated the use of a greater strength than 1 per cent. or the insertion of instruments into the cervix, considering that the former depressed the resistance of the epithelium and that the latter provoked salpingitis. I have not found that 10 per cent. mercurochrome depressed the resistance of the more delicate male urethra, in which I use it commonly for secondary infections and can see the effect by urethroscopic examination, so judge that it is not likely to do so in the case of the cervix uteri. On the other hand, any medicament applied to such a surface is rapidly diluted by secretions, and it seems reasonable to start with such a strength (always provided that it does not damage the tissues) as will take some time to dilute down to less than bactericidal strength since antiseptics do not act in-

stantaneously. With regard to Statham's injunction not to push instruments into the cervical canal, although I think it reasonable when one is using the frontal method of attack to get the medicament as close to the surface chiefly affected as possible, I would agree that there is danger in pushing an instrument into the canal so that some of it passes the internal os, or when the instrument is so big that, by a piston action, it may force infected secretion past this orifice. I do not think that this applies to a urethroscopic probe lightly dressed with wool and inserted just within the canal. The patient is instructed to douche daily with a mild antiseptic. The vaccine therapy is on the same principles as in the case of males.

It is possible here to describe only briefly the treatment of complications. For abscesses such as peri-urethral or Bartholinian I prefer aspiration followed by injection of electrargol or of 1 per cent. mercurochrome to incision. In peri-urethral abscess incision is more apt to be followed by urethral fistula than is aspiration, which leaves a buttress against the flow in the urethra. In prostatic abscess, hot hip baths supplemented by a suppository, night and morning, of Morphia and Extract of Belladonna, of each gr. $\frac{1}{2}$, usually give considerable relief. On the question of opening the abscess, if it is obviously working towards the deep urethra, the most usual course, I think it cannot do better than burst there; in this it may be assisted by the passage of a silk-web catheter at the time the abscess has caused retention of urine. The fear, expressed by some surgeons, that when a prostatic abscess bursts into the deep urethra it drains badly and becomes the seat of secondary infection seems to be a bogey, as I have never seen an abscess which burst in this way do otherwise than well. It is well after the abscess has burst to assist its drainage by daily, gentle massage of the prostate. If it appears clear that the abscess is working towards the rectum, or elsewhere than the deep urethra, opening by perineal section is indicated. Before and after the bursting of a prostatic abscess diathermy applied to the prostate seems to help. For epididymitis rest and hot applications (by Cataplasma Kaolini or by diathermy) over glycerine of belladonna give great relief and assist in resolution. Salpingitis only rarely calls for operation and usually subsides under rest and heat, applied both externally and by douching. In metastatic complications the great essentials are drainage of the focus in the urogenital canal and raising the resistance by vaccine treatment. Rest of affected joints and tendon sheaths is essential at first but can be overdone, and the first opportunity should be taken of instituting massage and passive movements to prevent the formation of troublesome adhesions. In gonorrhoeal ophthalmia drainage is all important, and on the least doubt about the pus getting away freely I would slit the outer canthus; for the rest, I have relied

mainly on hourly douching with boric acid lotion and daily painting of the mucous surfaces of the lids with 2 per cent. silver nitrate. Throughout the treatment of gonorrhoea and in tests of cure laboratory aid is indispensable, and in this I would include not only microscopic examination of smears, but cultures and the complement fixation test. The question of employing cultures may be difficult when the worker is far removed from a laboratory. It can be partially solved by drawing the secretion into a fairly stout capillary pipette and posting this, after sealing the open end of the capillary. Gonococci will remain alive in their native medium for a few days at room temperature, though they die rather easily when planted on a cold medium unless this is put at once into an incubator so that when there is no incubator at hand it is safer to transfer the whole secretion to the laboratory. In testing for cure in the male it is a good plan to start by massaging the prostate and vesicles and leaving most of the secretion in the urethra. The idea is that, if the massage has forced the contents of a prostatic or vesicular focus into the urethra, they will there cause a flare-up of the urethritis. A culture and smear of the fluid are taken at this sitting. At the next sitting, a week later, I usually examine with the urethroscope, dilate the anterior urethra fully with the Kollmann dilator and pass a full-sized sound into the bladder. At the third sitting I give a full dose of vaccine, and at one of the sittings a specimen of blood is taken for the complement fixation test. Although we may perhaps be not quite in a position to say that a positive complement fixation reaction some weeks after disappearance of all signs means that the patient is certainly still harbouring gonococci, such a finding is highly suggestive and calls for a repetition of all the other tests, with provocation designed to unearth buried foci. Naturally a steady diminution in the strength of the reaction after the signs have disappeared is valuable support in concluding that the infection has been eradicated. In women the tests of cure are on the same principles, specimens for slide and culture being taken immediately after each menstrual period for at least three months. In both sexes it is a good plan after the patient has passed these tests to repeat them after an interval of three months.

SOFT CHANCRE

The term soft chancre is applied loosely in England to all ulcerations of the genital organs that are not syphilitic or malignant. In any ulceration of the genital region the first question is whether or not the condition is syphilitic and, whatever the clinical appearance, specimens should be taken for microscopical examination. If the specimen has to be posted, the simplest plan, after cleaning the sore with water or saline and scraping

its edge, is to let the serum run into a capillary tube, one end of which is sealed in a flame. Pending a positive result I take specimens every day for some days and meantime dress with hypertonic saline (2 per cent. sodium chloride with 0.5 per cent. sodium citrate) avoiding antiseptics, which make the discovery of *S. pallida* difficult if not impossible. A specimen of blood is also taken, and it is a good rule in every case not meanwhile diagnosed as syphilitic to repeat the blood tests for three months. It is necessary to keep in mind the possibility of a creeping ulceration of the genitals and inguinal region being due to granuloma venereum, especially as the specific for this condition is antimony. Most soft chancres yield to saline dressings, soaking in eusol, iodoform dusting and painting with 2 per cent. mercurochrome. For those which do not, the local applications which have been advised are numerous enough to occupy a long article, and it is impossible to detail them here, but generally it may be well to say that coagulating lotions and drying powders ought to be avoided as they can easily provoke the formation of a bubo. For the typical soft chancre one remedy is invaluable. This is the intravenous injection of the Ducrey bacillus vaccine called Dmolcos, manufactured by the Société Parisienne d'Expansion Chimique Specia, 21, Rue Jean-Goujon, Paris—8^e, and sold in rubber-capped ampoules containing 15 c.cm. The first dose is usually 0.5 c.cm.; the second, given two days later, can be 1.0 c.cm., and this can be repeated on alternate days according to progress; usually only three or four doses are necessary. Each injection usually causes a smart rise of temperature, but the accompanying constitutional disturbance is not troublesome if the patient has taken the precaution of going to bed.

If a bubo occurs, the most satisfactory treatment is to aspirate the contents through a fairly stout needle introduced, through healthy skin if possible, at the external pole of the swelling. The aspiration may be supplemented by injection of a few c.cm. of colloidal silver; it may have to be repeated two or three times as the cavity refills. If the skin is on the point of breaking, a very small incision, in length equal to the width of a bistoury, across the lower and internal pole, followed by insertion of a small wick of gauze is better than a free incision. The bubo may from the first be of a more indolent kind than is that due to soft chancre and such a behaviour should raise the question of Lymphogranuloma inguinale or climatic bubo, a condition which, on account of its apparent increase in Europe, has recently aroused considerable notice. The diagnosis may be clinched by the occurrence of a reaction at the site of an intracutaneous injection of Frei's antigen on the forearm or other convenient site. Frei's antigen is a sterilized emulsion of the contents of a climatic bubo taken before this has burst.

SYPHILIS

If practitioners would appreciate the enormous difference it makes to the patient when the treatment is commenced before the serum reactions have become positive, they would avail themselves promptly of the microscopical test much more freely than they seem to do at present. It is very easy to scrape a sore and let the juice run into a capillary tube; all that is necessary is to keep the scraper (say a vaccination lancet) and a supply of capillary tubes at hand.

On what constitutes an adequate treatment of early syphilis the divergence of opinion is still very confusing. Various experimental courses have been tried at St. Thomas' Hospital, but the results from none of them have withdrawn my allegiance from a straightforward unit course consisting of 10 weekly injections of '914' intravenously with an equal number of an insoluble preparation of bismuth. This course differs from that which I formulated in 1919 at St. Thomas' Hospital in dispensing with intervals of two weeks after the third and fifth injections and of three weeks after the seventh, as later experience seems to show them to be unnecessary. The dosage of '914' is 3×0.45 , 2×0.60 and 5×0.75 , and that of the bismuth compound such as to contain 0.24 to 0.32 gm. metallic bismuth (say 3 c.cm. to 4 c.cm. of a 10 per cent. suspension of bismuth oxychloride which—the salt—contains 80 per cent. of metallic bismuth). For women, and for men who are rather under weight or react strongly, the dosage of '914' does not exceed 0.60 gm. In a number of cases I have varied the bismuth treatment by giving a lipo-soluble compound, such as the campho-carboxylate, in a dose of 2 c.cm. twice weekly, but am not in a position to say that it gives better results. Nothing has occurred to shake my conviction that the bismuth should be given concurrently with the '914'. On the contrary, it has been strengthened by the report of a careful analysis of results of treatment carried out recently in the United States by five first-class clinics. In this report appeared the following,² written, I believe, by Dr. Earle Moore, who had hitherto been an advocate of alternating arsenical courses with courses of 'heavy metal': 'It seems an inescapable conclusion that this omission of some heavy metal treatment during the first course of arsphenamine is a factor in the much higher incidence of early infectious relapse and neuro-recurrence at Clinic B. In early syphilis, including early latency, treatment with a heavy metal should be started before the conclusion of the first arsphenamine course, and should completely fill the interim between courses.' The number of courses that should be given is difficult to decide. In some cases very little treatment seems on later observation to have eradicated the disease, but it is a bad mistake to risk a relapse,

and the patient who is determined to have everything possible done to eradicate his infection is not interested in forms of treatment affording less than 100 per cent. of success. Accordingly I do not feel justified in advising him to have less than three such courses as the above, if his serum reactions are not yet positive. If they are positive, I advise three after that course which ends with negative reactions. Later experience has inclined me to shorten the interval between any two courses to six weeks. In later cases with no symptoms much depends on the state of the spinal fluid. If this is negative, after an initial course as outlined above, I rely mostly on bismuth, a practice which is supported by the American analysis already mentioned, in which treatment solely with heavy metal appeared to have given as good results as that with arsenic and heavy metal. It is necessary to continue the treatment for some years before the serum reactions become negative. It is incorrect to say that in most of these cases the serum reactions are unaffected by treatment. In most cases the true strength of the reaction is not titrated out to an end point. When it is, as occurs automatically with the Sigma test, the effect is usually noticeable by the end of the first course. In cases with signs of cardiovascular disease I usually commence treatment with a course of 10 injections of a bismuth compound and at the same time give potassium iodide in doses as high as the patient can tolerate. In the second and subsequent courses I give also sulpharsphenamine deep subcutaneously in small doses, usually not exceeding 0.8 gm. twice weekly. In cases of gummatous hepatitis it usually seems best to withhold arsphenamine, which is a liver poison. When the spinal fluid is found to be positive in a case of more than three or four years' duration treatment on the above lines is unlikely to convert it to negative, and after an initial course of '014' and bismuth it seems best to change over to courses of tryparsamide (1 x 2 gm. and 0 x 8 gm. at weekly intervals) in conjunction with bismuth. Patients who show no intolerance of tryparsamide, in the form of disturbance of vision, seem able to stand very large total amounts of this remedy, and five or six courses at intervals of about six weeks are not excessive treatment. Malarial treatment is very valuable in cases of syphilis of long standing with positive spinal fluid, but it is not yet sufficiently convenient to obtain it for average patients in such safe circumstances that it can be recommended in the absence of symptoms of G.P.I. When, by the establishment of centres for this form of treatment, it becomes possible to apply it safely as a matter of routine, we can look forward to a considerable reduction, if not a complete abolition, of the incidence of G.P.I. If the patient is showing clinical signs of G.P.I. the sooner malarial, or an equally effective form of pyrogenic treatment, is given, the better, as every day's delay means

more irreparable damage of the brain parenchyma. After the malarial treatment I give some courses of tryparsamide. Tabes does not seem to respond to malarial treatment so uniformly well as does G.P.I. On the other hand bismuth injections with iodide by mouth often act very well. After the first course I commonly give one of silver-salvarsan in doses up to 0.25 gm. twice weekly to a total of 20, then another course of bismuth and iodide and so on as long as the patient appears to be doing well. Tryparsamide sometimes acts well in tabes, but in many cases it seems only to aggravate the pains without causing any compensating improvement in the other signs so I usually reserve it for cases that are not responding to the treatment on the lines suggested above.

In conclusion I fear that the above remarks must appear to be very sketchy but they are not intended to do more than indicate very broadly the lines on which the commoner manifestations of venereal disease can be treated with a reasonable prospect of success.

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² V.D. *Information*, 1932, Nos. 4 to 12, p. 391.

SECTION V

MEDICINE

1. MEDICAL NOTES. *By Lord Horder.*
2. RECENT ADVANCES IN MEDICINE. *By Dr. E. C. Warner.*
3. EXAMINATION FOR LIFE INSURANCE. *By Dr. Burton Fanning.*

MEDICAL NOTES¹

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ON SOME ABDOMINAL DISEASES

(1) Because a patient suffering from ulceration of the stomach is elderly it is not uncommon to argue that this fact favours malignancy. The argument is fallacious, because peptic ulcer is quite common in men over seventy years of age. Age, of itself, therefore gives no help in differential diagnosis.

(2) In the differential diagnosis of simple from malignant ulcer of the stomach too little stress is often laid upon the significance of a frank hæmatemesis. In the presence of this complication simple ulcer becomes highly probable, for erosion of an artery rarely occurs in carcinoma, whereas it is a common event in simple ulcer.

(3) The association of enlargement of the spleen with hæmatemesis occurs in splenic anaemia and in cirrhosis of the liver. The differential diagnosis is usually not difficult. But there is a third possibility, though a rare one—an old-standing peptic ulcer which, by dense perigastric adhesion, has caused thrombosis of the splenic artery.

(4) It is fairly well known that an enlarged spleen, whatever its associations, not seldom becomes much smaller after an attack of hæmatemesis or melæna. It is interesting to observe that, in splenic anaemia at all events, a large spleen may become so small when the patient is under ether anaesthesia that the organ cannot be palpated just prior to a laparotomy. This fact no doubt accounts for the discrepancy which sometimes occurs between the state of the spleen as recorded before operation and observation as to the condition of the organ during it.

(5) Portal thrombosis can scarcely be diagnosed with certainty. But if a patient, known to suffer from cirrhosis of the liver, develop signs of intestinal obstruction with enterorrhagia, there is strong presumptive evidence that this is the nature of his trouble. This diagnosis may also be found to be correct if, with acute abdominal symptoms, a patient who has previously

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shown a tendency to venous thrombosis, but is free from cardiac and renal disease, develops ascites within the space of a few days.

(6) Ascites arising insidiously in a woman in whom there are no other symptoms or signs (*e.g.* of heart, kidney or liver disease) is generally due to ovarian adenoma. The growth, being sometimes very soft in consistency, may not be felt by vaginal examination, and so may require laparotomy for its demonstration.

(7) The most frequent antecedent to suppurative pyelophlebitis (portal pyæmia) in this country is operation for a septic appendix. Desperate though the condition is, recovery does occasionally take place, the patient living long enough to admit of coalescence of the multiple foci of suppuration and evacuation of the abscess so formed.

(8) Single abscess of the liver, when not due to dysentery, is most often due to *Staphylococcus aureus*. The condition may give rise to an obscure pyrexia for many weeks, in this particular exceeding perinephric abscess, with which disease it has affinities in causation and in the difficulties which may surround the diagnosis.

(9) Eosinophilia in disease of the liver is not peculiar to hydatid disease. It may occur in some other diseases of this organ as in neoplasm, especially if the growth be a rapid one.

ON SOME ABDOMINAL CONDITIONS

(1) In the routine examination of the abdomen the same procedure should be followed as in examination of the thorax—inspection, palpation, percussion and auscultation. Of these methods the first often receives much too scant attention, whilst the last is generally omitted altogether. Time and care spent upon inspection are never lost, and valuable information, which is not available by any other method, is often gained. The abdomen should be inspected from the head and from the foot of the bed, as well as from the side, and with the observer's eye upon a level with the abdomen as well as above it.

(2) Despite the fact that the liver lies mainly on the right side, and that the 'lie' of the hollow viscera is essentially asymmetrical, the shape of the healthy abdomen, regarded as a bilateral structure, is quite symmetrical. Even the slightest deviation from symmetry should therefore be noted. Whether the significance of this be serious or trivial is a consideration which should be left until the whole examination is complete.

(3) Examples of data, and their significance, obtained by auscultation of the abdomen are the following: The discovery of

friction over a tumour in the left hypochondrium, suggesting perisplinitis; the presence of a bruit over a large hypernephroma, suggesting that the tumour has large blood-vessels connected with it, and that its removal would thereby entail grave risk.

(4) In the estimation of free fluid in the peritoneal cavity, the method of '*ballotement*' is sometimes more convincing than the examination for 'fluid thrill'. This is particularly so when there is present also some solid organ, such as an enlarged liver, over which this special method of palpation may be employed.

(5) Abdominal pain must always be carefully distinguished from abdominal tenderness, and a separate note should be made under each heading. Pain is independent of the observer's examination; tenderness is a painful sensation elicited during palpation.

(6) Abdominal tumours in anomalous situations, and possessing unusual features, especially if the patients present little or no evidence of visceral disease—consider the possibility of cysts, such as of the pancreas, of the omentum of the liver.

(7) In 'cystic disease of the kidneys' small cysts are not infrequently found in the liver during post-mortem examination. Rarely, one of these liver cysts may give signs and symptoms during life. To remember these facts may lead to a diagnosis of the main disease by discovering that one or both kidneys are enlarged or (and) that the patient presents the general features, cardio-vascular and metabolic, of the condition.

(8) Bearing in mind that the gall-bladder in chronic cholecystitis is frequently contracted and adherent, it is not surprising that it is a common experience not to be able to feel the organ, even in the presence of an exacerbation of the inflammation. The absence of signs of a gall-bladder tumour is therefore not only no evidence against the diagnosis; this fact is quite compatible with it.

(9) Tuberculous peritonitis is much more often diagnosed, and diagnosed correctly, in the absence of direct evidence of tuberculosis than in its presence. For isolation of the tubercle bacillus from the liquid effusion (if this be present) is rarely possible, and, since the disease is more often than not confined to the abdomen, 'signs of tuberculosis elsewhere' are not usually forthcoming.

(10) 'Tumours' that can be felt in the abdomen in a case of tuberculous peritonitis are of varied nature. They may be (1) 'indurations' caused by thickening of the peritoneum by the plastic inflammation, (2) enlarged (caseous) lymph-nodes,

(3) sacculated collections of fluid, (4) the inflamed (tuberculous) appendix, (5) tubo-ovarian ' abscess ', (6) coils of tympanitic bowel, and (7) faecal masses.

ON SOME INTESTINAL CONDITIONS

1. Faced with a case of coliform infection of the urinary tract, associated defects in the alimentary tract should always be considered. These are of three kinds: (i) Gross pathological conditions are uncommon, but are of great importance when present: diverticulitis, appendicitis, fistula and gall-bladder sepsis; (ii) Constipation, usually of the type known as colon stasis; (iii) Intestinal sub-infection.

2. Any condition tending to increase constipation may be a factor in the protraction of coliform urinary infection, and the relief of these conditions may be followed by marked improvement in the urinary condition. Such conditions are hæmorrhoids and fissure *in ano*.

3. The degree of pyuria present in some cases of diverticulitis in which there is associated infection of the urinary tract is sometimes so marked that a diagnosis of fistula between the bowel and the bladder or ureter is made. But cystoscopic examination, and the subsidence of the pyuria with effective treatment of the bowel disease, suffice to negative this conclusion.

4. The disabilities associated with enteroptosis are to be attributed much more to the physiological troubles (circulatory and nervous) arising from the condition than from the anatomical ' lie ' of the organs. This is proved by the fact that when the patient has made considerable progress as the result of a general scheme of treatment, radiological examination shows that the position of the viscera has scarcely, if at all, changed.

5. Enteroptosis is to be regarded as being more often part of a general neuro-muscular asthenia than an entity in itself. Although surgical treatment of the condition may be followed by good results for a time, these good results are probably due to the psychic effect of the operation and the prolonged recumbent rest which is usually enjoined after it.

6. So much attention has been drawn in recent years to ' duodenal ulcer ' that other diseases of the duodenum have been overlooked or forgotten. Yet a critical study of actual cases of duodenal dyspepsia makes it clear that ulcer is by no means the only morbid condition present. Biochemical investigations amply confirm this statement.

7. The infective factor in ulcerating colitis remains indeterminate. The balance of recent evidence favours the strepto-

coccus rather than the coliform group. The results of immunotherapy are disappointing, and successful treatment depends more upon general than upon specific measures. The benefits claimed for anti-dysenteric sera are to be attributed to non-specific rather than to specific action. The diet should not be milk, but should be quite generous both in amount and in variety, always bearing in mind the importance of obtaining a soft and homogeneous residuo. The semi-Trendelenburg posture is of great help. Tonic and hæmatinic drugs are useful.

8. As in other forms of intestinal ulceration (typhoid, tuberculosis, etc.), there is no necessary association between the degree of diarrhoea and the number or extent of the ulcers in ulcerating colitis. In a recovering case actual constipation may, and often does, occur long before the ulcers are healed. Since relapses are very common, the patient must be kept under observation until sigmoidoscopic examination shows a satisfactory state of the bowel.

9. Enterorrhagia, sometimes quite profuse, and without other symptoms, is not very uncommon in elderly patients. The pathology of the condition is obscure. The patients are more often male than female. Hyperpiesis and atheroma may be present. Evidence of duodenal ulceration, which is a favourite hypothesis, is not forthcoming in most of the cases; moreover, the blood is sometimes bright in colour. There is a tendency for the condition to recur at fairly lengthy intervals. Treatment by entirely recumbent rest and a meagre diet suffices as a rule, though there may be a residual anemia which requires attention.

10. Though it is often said that an inflamed appendix is 'felt,' it is very doubtful if this is so. If an appendix is actually felt it is likely to be the seat of neoplasm, such as endothelioma. The structure which is felt and which is most often mistaken for an appendix is an enlarged tuberculous gland.

ON THINNESS AND FATNESS

1. In any case of loss of weight in which the cause is obscure, the first consideration should concern the food swallowed—whether this be sufficient to maintain nutrition. The second consideration should be directed towards the question whether or no the food leaves the body, by vomiting or by diarrhoea, before it can be properly digested and assimilated. The investigation should then proceed in such a way as to eliminate the following factors: Microbic infection (especially tuberculosis), neoplasm (especially of the alimentary tract), metabolic defects (especially diabetes and pancreatic deficiency), endocrine imbalance, (especially hyperthyroidism and nerve diseases).

2. Loss of weight may be the first complaint in Graves's disease, and unless the observer be sensitive to the facies presented in the early stages of exophthalmic goitre, or unless the possibility of this disease be thought of, as it should be in all wasting of obscure nature, the diagnosis may go overlooked for some time. The patient most likely to give rise to this difficulty is a man in the later years of life, for in this case neither the sex nor the age of itself suggests the existence of Graves's disease.

3. If, in a young woman who is emaciated, tuberculosis, diabetes and Graves's disease can be excluded, the probable cause of the trouble is 'anorexia nervosa' or some allied psychosis.

4. In both diabetes mellitus and exophthalmic goitre the prognosis is better in the 'fat type' of the disease than in the 'thin type'.

5. Many fat patients profess themselves small eaters. Though it is true that some of them do eat very little, all should be suspect until the evidence is indisputable.

6. It is too often assumed that fat patients who are short of breath have fatty hearts. The satisfactory response made by many such patients to general measures of treatment, and to graduated physical exercise, gives strong support to this statement.

7. The diagnosis of 'fatty heart,' as against certain other forms of myocardial disease, is not possible.

8. Localized deposits of fat are sometimes mistaken for other and more serious things. In the neck they may be mistaken for an enlarged thyroid and also for enlarged lymph-nodes. In the abdomen they may be mistaken for tumours (and especially for cysts) and for ascites. These errors are more likely to occur if the fat has appeared rather quickly, as is not infrequent at the menopause.

9. It is not only in Dercum's disease that fatty deposits are painful and tender. This is not infrequently so in 'fibrositic' or 'gouty' subjects who become fat. As is the case in adiposis dolorosa proper, the patients are generally women.

10. Rapid loss of weight sometimes renders conspicuous lipomata, the existence of which was previously unknown. A lipoma on the back of the chest, brought to light in this manner, has been mistaken for a pointing empyema.

11. A fatty liver is perhaps more often overlooked than is any other considerable enlargement of this organ. The reasons

are these: The texture is not so firm as to make palpation easy; the organ is not tender; and the observer, if he be not aware that a fatty liver may be very large and yet give no symptoms, may fail to palpate the abdomen sufficiently low down to feel the free border of the viscus.

ON SOME URINARY DISEASES

1. The custom of collecting the 24 hours' urine and putting up a specimen for examination, whilst being a useful routine procedure in general cases, is far from being the best in special cases. Saving individual specimens separately as they are passed often gives valuable information in urinary diseases, especially when focal lesions are suspected.

2. The significance of casts in the urine must be taken in relation to the question whether or no the material was centrifuged before the search is made. In the latter case the finding of an occasional hyaline or granular cast in the urine of a patient over 50 is not necessarily pathological.

3. The odour of the urine in coliform urinary infection is so characteristic that a diagnosis can often be made by this observation alone. The smell is quite different from that of ammoniacal urine, with which it is sometimes confounded. The smell is not present in coccal infections, however severe.

4. Relapses are so common after acute coliform infection of the urinary tract that their occurrence constitutes a feature of the disease. The presence of excess of mucus or (and) phosphates in the urine should be regarded as a danger-signal in this connection. The source of these reinfections is probably, in a considerable number of instances, a residual prostatitis.

5. The significance of the isolation of staphylococci from the urine is quite different, according as the coccus is *S. aureus* or *S. albus*. In the former case the presence of staphylococcus pyæmia is to be suspected, with subcapsular or perinephric foci. In the latter case the coccal infection is probably secondary (to calculus, tuberculosis, gonorrhœa, etc.).

6. It has been suggested that in albuminuria the nature of the protein helps to distinguish the 'functional' from the 'organic' cases, the protein being wholly or mainly serum-globulin in the former, and wholly or mainly serum-albumen in the latter. Fuller experience, however, has shown that this inquiry possesses no differential diagnostic value.

7. The appropriate treatment of a case of 'functional' albuminuria is almost the antithesis of the appropriate treatment of a case of nephritis. If, therefore, a functional albuminuric

is treated as nephritic he fails to improve. This fact sometimes seems to confirm the diagnosis of organic disease, and so the error is prolonged.

8. It is important to remember the frequency of associated renal lesions—pyelitis with calculus, pyelitis with calculus and with neoplasm. The demonstration of pyelitis, therefore, especially if chronic or recurring, should never be accepted as a full diagnosis until other conditions have been considered and, so far as possible, eliminated.

9. Hæmaturia in association with morbus cordis occurs in three conditions: (i) In septic endocarditis, the blood resulting from renal infarction, mostly in small (and it may be microscopic) amounts; (ii) in mitral stenosis, the blood again resulting from renal infarction, but generally in larger quantity; (iii) in dilatation, with visceral engorgement, the source of the bleeding being the renal congestion.

10. If hæmaturia occurs in an elderly man as the result of prostatic bleeding, the condition of the prostate is more likely to be a 'simple,' soft, adenomatous enlargement than a carcinoma.

11. Symptomless hæmaturia is generally due to a readily ascertained focal lesion, such as vesical papilloma, renal neoplasm or renal calculus; or it escapes explanation altogether ('essential hæmaturia').

ON SOME DISEASES OF THE HEART

1. The heart of some pubescent boys is not infrequently judged to be diseased because the impulse is a little heaving and the first sound at the apex is not quite clear. The failure to recognize these features as physiological sometimes leads to the boy being taken away from school or, almost equally unfortunate, places a veto upon his games.

2. There is a form of chronic dilatation of the heart in which, though the apex-beat may be widely displaced, and the area of cardiac dullness may be considerably enlarged, the rhythm is perfect, there are no bruits present and no signs of 'decompensation'. Even the response to effort may show very little departure from the normal.

3. During chronic dilatation of the heart the patient's symptoms may be contributed almost entirely by certain viscera upon which the brunt of the congestion comes at the moment. If this fact be not realized errors in diagnosis may be made very easily. (i) The lungs: hæmoptysis may be mistaken for pulmonary tuberculosis or for neoplasm. (ii) The liver: pain,

tenderness and rapid swelling of the organ may lead to exploration for abscess. (iii) The kidney: the resulting signs of renal insufficiency may be mistaken for nephritis. (iv) The brain: excitement and delirium may fail of the correct interpretation.

4. In the absence of breathlessness with effort myocardial insufficiency can be excluded with considerable confidence. But if breathlessness be present, and especially if some unaccustomed exercise be imposed upon the patient in order to test his reaction to this, myocardial insufficiency must not be at once assumed. The three most common fallacies are obesity, emphysema and a sedentary life. This caution applies to the other features in the 'effort syndrome' as much as to breathlessness.

5. Acute ventricular failure does not lead to orthopnoea. In this condition it is the facies of the patient, rather than his posture, which helps in the appreciation of the state of affairs.

6. The serious prognostic significance of Cheyne-Stokes breathing in diseases of the heart only appertains when the patient is awake. If this sign is present during sleep it is not necessarily *malum signum*.

7. Despite the absence of evidence, both during life and after death, it is still commonly said that death in uncomplicated pneumonia is generally due to heart failure. In the majority of such cases death is due to the direct action of the pneumococcus toxin upon the bulbar centres.

8. Alternate constriction and dilatation of the capillaries of the face (pallor and flushing) is sometimes seen in progressive heart failure in association with cardio-arterial sclerosis. It is a bad sign.

9. The absence of physical signs, whether of cardiac or aortic disease, in a patient who complains of anginal pain is often regarded as a good point. The converse is probably nearer to the truth—that if a patient describes attacks which leave no doubt in the physician's mind as to their anginal character, and examination is entirely negative, the outlook is bad.

10. Sudden and very severe pain, resulting from causes extrinsic to the heart, if associated with heart shock, may simulate angina pectoris very closely. Such causes are (i) above the diaphragm: the onset of pericarditis or of diaphragmatic pleurisy; (ii) below the diaphragm: ruptured peptic ulcer, acute cholecystitis and acute hæmorrhagic pancreatitis.

RECENT ADVANCES IN MEDICINE

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1. THE TREATMENT OF ACUTE AND SUBACUTE ATROPHY OF THE LIVER

The functional activity of the liver may be damaged or destroyed by many different causes, usually by toxins which may be known (*e.g.* N.A.B.), or unknown. When the liver cells are severely damaged, acute or subacute atrophy (or necrosis) of the liver ensues. The main therapeutic indications are: (I) Remove the cause when possible. (II) Give copious fluids (5-6 pints daily), avoiding all meat, meat extracts, and giving a low fat diet. (III) To maintain the nutrition of the patient without entailing any strain on the liver cells, and to protect them with an adequate store of glycogen, give glucose in doses of $\frac{1}{4}$ lb. a day, combined with insulin (5-10 units t.i.d.). If there is vomiting or the patient is very ill, 300 c.c. of 10 per cent. glucose must be given intravenously each 12-15 hours with corresponding insulin (10 units) twice daily. (IV) An adequate amount of free calcium undoubtedly protects the hepatic cells, even when the blood calcium is normal. In mild cases, calcium gluconate (60 gr. t.i.d.) or calcium sodium lactate (30 gr. t.i.d.) before meals, with a calcium rich diet (especially skimmed milk), and Parathormone (Collip) 10-15 units b.d. are sufficient. In severe cases, for the first 1-2 days, 10-15 c.c. of 10 per cent. calcium gluconate must be given by intravenous or intramuscular injection each 4-6 hours, with similar doses of parathormone, the doses being reduced when the serum calcium value rises above 13 mgm. per cent.

2. THE TREATMENT OF ADDISON'S DISEASE WITH CORTICAL EXTRACT OF SUPRARENAL AND WITH SODIUM CHLORIDE

The treatment of Addison's disease is likely to be put on a much more concrete basis as a result of recent research. It has been known for a long time that the cortex of the suprarenal gland is of much greater importance for life than the medulla, as experimental aseptic destruction of the latter is not usually fatal. From the cortex of the suprarenal an extract has been prepared by Swingle and Pfiffner which will maintain life in suprarenalctomized animals. In human cases of Addison's disease the cortical extract (eucortone and eschatin) can be administered by intravenous, intramuscular or subcutaneous injection. In cases showing a severe grade of the disease, 15 c.cm. of eucortone should be administered daily, with 1 pint of 5 per cent. glucose in saline, and as the clinical condition improves, the dose may be reduced to 8-5 c.cm. daily subcutaneously. The improvement is often rapid, with cessation of vomiting, diminution in the lethargy and mental depression, and gradually diminution in the general pigmentation, with rise of

blood pressure. A further line of treatment is largely due to the work of Baum and Kurland and Loeb. They found that suprarenalectomized animals, and patients with Addison's disease, show a low blood content of sodium and chloride, and an increased content of potassium. Correction of this may be made by giving 5 to 15 grammes of sodium chloride daily by mouth. This should be given throughout the day, on food, in milk or in capsules, and results in a great improvement in the general strength of the patient, cessation of vomiting, and often a rise of blood pressure. In severe cases, sodium chloride and cortical extract should both be given, but sodium chloride by itself has maintained a fair degree of health in a patient for 16 months without the use of cortical extract. The relation between these two substances is still under investigation.

3. AGRANULOCYTIC ANGINA AND ITS TREATMENT

Agranulocytic angina is characterized by an acute inflammation of a mucous membrane, usually of the throat, and is associated with a great diminution in the circulating polymorphs of the blood. It tends to occur more commonly in middle-aged and elderly women, and has an acute onset, with fever, headache, pains in the back and limbs, with extreme exhaustion and toxicity. The tonsils, palate, pharynx or tongue develop shallow ulcers, covered with a greyish-white membrane: on section there is no polymorph reaction in these tissues, and extensive gangrene may occur. On account of this lack of a local barrier it is quite common to obtain a positive blood culture. Examination of the blood shows a considerable or extreme reduction of the total white cells which may be well below 1,000 per cu. mm., and the polymorphs form under 10 per cent. of the total leucocytes. The red cell and platelet counts are usually normal.

The condition appears to be due to lack of formation of the white cells of the blood by the bone marrow. Agranulocytosis may be due to a known toxin acting on the bone marrow, as in severe bacterial infection, poisoning with N.A.B., benzol, lead, barbiturates or radium: but in these cases with agranulocytosis accompanied by angina, usually the cause is unknown.

Treatment consists in giving pentose nucleotide intramuscularly (10-20 c.c. twice daily) until the white cell count has risen (this usually commences on the fourth day), and then half this dose until the cell count has been normal for three days. As there is no rise in the cell count for the first three days, in severe cases a preliminary blood transfusion will supply a small number of white cells. The diet must contain copious nutri-

tious fluids. The mortality is very high, but with this treatment a recovery rate in 3 cases out of 4 has been recorded.

4. THE KETOGENIC DIET IN BACILLUS COLI INFECTIONS OF THE URINARY TRACT

The observation that specimens of urine of diabetic patients show a delayed growth of *B. Coli.* so long as a marked degree of ketosis is present, has lead to the introduction of an artificial ketosis as a method for sterilizing the urine of patients infected with this organism. A ketogenic diet is one containing 10-20 grammes of carbohydrate and 250 grammes of fat, with preferably a protein content of 30-40 grammes, and a specimen diet is shown below. It is very irksome and occasionally nauseating to take so much fat, and this should be explained to the patient beforehand, as his co-operation is essential. The sterilizing agent is probably β -oxybutyric acid, and the larger the amount of this produced, the more rapid the result. The patient should not have any considerable degree of pyrexia, must not be too debilitated, and is preferably not confined to bed. From the commencement of the diet the urine is examined by the ferric chloride test for the presence of aceto-acetic acid (which always accompanies β -oxybutyric acid) and a strong positive reaction is essential. Also the more acid the urine the better, and the P_H of the urine must be kept below 5.5, aided if necessary by the administration of ammonium chloride or ammonium nitrate (1-3 grams daily in capsules). To increase the concentration of the β -oxybutyric acid, the total fluid intake should be not more than 2 pints per day. Within 2, or at the most 3 weeks, the urine will be rendered sterile in 80-90 per cent. of cases, provided these two criteria are fulfilled. Failure may result if there is extensive pyelonephritis, as the kidney may not be able to excrete the acids; also because it may be impossible to get a sufficient concentration of ketonic acids (especially in the puerperium); and because nausea or diarrhoea may make it impossible to tolerate the diet. In obstinate cases of bacilluria, or after the surgical removal of calculi, etc., this diet has proved to be of great value.

KETOGENIC DIET (AS USED AT CHARING CROSS HOSPITAL)

FOR ADULT OF 10-11 STONE

(C.20 gms. P.45 gms. F.220 gms. Calories 2300)

Milk. 5 oz. in tea, junket or jelly.

Butter. 2 oz. with diabetic biscuits or bran cakes, in omelettes with scrambled eggs or in vegetable purée.

Eggs. 2.

Fat Meat. 2 oz.

- Cream.* 1 oz. as vegetable cream soup, fruit fool, in tea or coffee.
- Fried Fat Bacon.* 2 oz.
- Midolia Biscuits.* (Van Abbott's) 1 oz.
- Olive Oil.* 3 oz.
- 15% *Vegetables* (apples, oranges, pears, grapes). 1 oz.
- 5% *Vegetables* (greens, tomato, salads, stewed fruit). 4 oz.
- Fluids* up to 2 pints daily, without sugar, but with saccharine if desired.
- Can replace 1 egg or 1 oz. cream or $\frac{1}{2}$ oz. olive oil by 1 oz. cream cheese, 1 oz. roast goose, 1 oz. boiled ham, 1 oz. tinned ox tongue.

SPECIAL POINTS.

1. Urine must give good strong FeCl_3 reaction in each specimen.
2. Patient allowed moderate exercise.
3. Urine must be below Ph 5.5. If not, give 1-3 grammes ammonium chloride per day in capsules.

5. THE TREATMENT OF BARBITURATE POISONING

Poisoning with barbituric acid derivatives is not uncommon, particularly as these drugs are so readily obtained. As the coma deepens, bronchitis and basal pneumonia develop in most cases, and it is from these that most patients die. Other complications are a toxic myocarditis, with great weakening in the force of the heart, and so the rapid pulse rate is accompanied by a falling blood pressure; and the toxic renal effects may produce urinary suppression. There is a great variation in individual susceptibility, but patients with previous myocarditis or with hepatic or renal deficiency, are much more readily affected. Eliminative treatment is mainly directed to washing out as much drug as possible by repeated gastric and colonic lavage, by giving copious fluids and glucose by a nasal tube and by the rectum, and by removal from the brain by repeated withdrawal of cerebro-spinal fluid. Ten c.c.s. of C.S.F. should be withdrawn by lumbar or cisternal puncture each 12-24 hours. Specific measures claimed to be of value are: (i) the slow intravenous injection of 30 c.c. of 30% alcohol each hour until the patient wakes; (ii) the use of full doses of strychnine or coramino.

6. BASAL METABOLIC RATE

The basal metabolic rate is an index of the metabolic rate of a fasting person at complete rest, and is usually expressed in relationship to the average basal metabolic rate of a person of the same sex and age. Thus a result may be given in the form of a raised or lowered B.M.R. by saying that the value is +50 per cent. or -20 per cent., it being understood that these

are values compared with the average normal values. There is a normal range of approximately ± 15 per cent. in healthy individuals. Any value much above or below these limits must be considered as pathological. A high value (+20 to +100 per cent.) is of value in confirming the presence and indicating the degree of hyperthyroidism (thyrotoxicosis), especially in those cases known as 'masked hyperthyroidism' where the amount of enlargement of the thyroid gland is slight: the rate is also raised in cases of acute leukemia and in hæmolytic conditions. A low value (-15 to -50 per cent.) is met in myxœdema and cretinism, and a value of -10 to -20 per cent. is often met in deficiency of the anterior lobe of the pituitary gland: with such low values, thyroid should be administered until the value reaches normal limits.

7. CHOLECYSTOGRAPHY

Graham and Cole discovered that the sodium salt of tetrabromphenolphthalein is almost exclusively secreted by the liver and concentrated by the gall-bladder. This has led to a valuable means of X-raying the gall-bladder. The salt now more commonly used is sodium tetraiodophenolphthalein, as this is more opaque than the bromine compound, and so smaller doses can be used. It is usual to give the salt in keratin coated capsules by mouth in doses of 2.5–5.0 grammes at, say, 10 p.m.; no more food or drink is taken until after the completion of the test. At 14 and 18 hours afterwards radiograms of the gall-bladder are taken, followed by a fatty meal of poached egg and buttered toast. A further radiogram is taken at 21 hours. In the normal subject, often a faint outline of the liver is obtained: the gall-bladder will be uniformly opaque in the first two radiograms and will be contracted and nearly empty in the third. This indicates that the salt was satisfactorily excreted by the liver, and that the gall-bladder can dilate, contract and also concentrate it. Occasionally the gall-bladder is not outlined because the capsules have been vomited, or have remained in an undigested condition in the colon. (The test should then be repeated by intravenous administration of the salt.) But if satisfactory absorption has occurred, non-filling indicates a pathological lesion, usually cholecystitis, or a calculus blocking the cystic duct. In other cases the dye can be seen surrounding calculi in the gall-bladder, and so non-opaque cholesterol stones may be outlined. Deformity of outline of the gall-bladder, or local tenderness, may be valuable indications of disease.

This test is of general application to cases of suspected gall-bladder disease, but should not be used when there is advanced cardiac disease or with obstructive jaundice: in this latter case not only will it be impossible for the liver to excrete the salt,

but its accumulation may cause serious harm to the already embarrassed liver cells.

8. COELIAC DISEASE AND ITS TREATMENT

Celiac disease is a disease of infancy and childhood characterized by the passage of large, bulky, pale, offensive stools containing an excess of split fat. The fat content of the faeces in such cases is always more than 25 per cent. of the dried weight, and of this fat at least 75 per cent. is split into the forms of soaps and fatty acids. The onset of the condition is usually insidious, occasionally more acute between the ages of 9 months and 2 years: associated with this, failure to gain weight or actual loss of weight, stunting of growth, distention of the abdomen and wasting of the buttocks are prominent features. There are two main varieties, those in which intestinal fermentation is excessive, so giving rise to diarrhoea, and the other form in which diarrhoea is not prominent; but in most cases diarrhoeic and non-diarrhoeic periods are present at different times.

TREATMENT.—As the patient is unable to absorb fat, the amount of this given must be limited, and the excessive fermentation with flatulent distention of the abdomen is an indication to limit the carbohydrate intake. The use of the high protein diet has been a great advance in the treatment of coeliac disease, and it must be combined with an adequate amount of vitamins to prevent scurvy and coeliac rickets developing. At first the diet must be severely limited, especially as regards the amount of fat given (Stage I) later, as the diarrhoeic periods become less frequent, the stools less fatty, and the general condition of the child improves, careful additions may be made. Gain in weight and general progress are slow at first, but satisfactory later.

A diet constructed on these principles and found of great advantage is:—

STAGE I (patient aged 9 months, weight 14 lbs.) :—

Skimmed Cow and Gate Milk (1 dr. to $1\frac{1}{2}$ oz. water) $5\frac{1}{2}$ ozs. Add Plasmon, Protosol, Casec, Casein, or similar casein preparations ($1\frac{1}{2}$ gms. per oz.) 8 gms.

To be given 3-hourly (7 feeds a day).

Marmite $\frac{1}{2}$ dr. twice daily.

Radiostoleum 10 minims daily.

One quarter of a very ripe banana, with brown parts cut away, and strained through a hair sieve or muslin.

Total Calories 635 per day.

STAGE II (patient aged 11 months, weight $14\frac{1}{2}$ lbs.) :—

As for Stage I, except at midday, replace milk feed by Veal bones, boiled for 5 hours with 1 small potato and $\frac{1}{2}$ carrot. Skim off all fat. Start with 1 oz. Increase very gradually to $1\frac{1}{2}$ oz. and then 2 ozs. Can alternate this with breast of chicken or pounded rabbit . . . 1 dessertspoonful at first.

One-half of a very ripe banana, with brown parts cut away, and strained through a hair sieve or muslin.

STAGE III (patient aged 14 months, weight 16 lbs.). Gradually change over to :—

1. Hand-skimmed Cow's Milk. (Grade A. Tuberculin-tested.) Allow to stand in a cool place for 5 hours and then skim off all cream. (In warm weather heat till scalded, 'till the bubbles rise', before standing for the 5 hours.) Give 2 pints a day. Add Plasmon 5 grammes to each feed 8-hourly.
 2. At midday—Veal bones, boiled for 5 hours with 1 small potato and $\frac{1}{2}$ carrot. Skim off all fat. Increase very gradually from 2 ozs. Can alternate this with breast of chicken or pounded rabbit.
 3. $\frac{1}{2}$ very ripe banana. Must be very ripe, and put through mushin.
 4. Very dry toasted bread to chew, or better Zwieback bread. (Callard's or Fortnum and Mason).
 5. $\frac{1}{2}$ sponge finger. Increase later to whole one.
 6. White of egg only—could be added to banana pulp.
 7. Continue Radiostoleum min. 10, and Marmite $\frac{1}{2}$ teaspoonful a day.
- Total Calories 650–700 per day.

STAGE IV :—

At the end of 9–12 months' treatment, depending on the condition of the patient, and the frequency and composition of the stools, gradually change to half cream milk (30 fl. ozs. daily) with added protein as in the following scheme :—

Breakfast:

Cornflakes or similar cereal preparation.
Half-cream milk ($\frac{1}{2}$ pint) with added casein 5–10 gms.
Bread baked in oven in thin slices, or Zwieback, with honey or Marmite or mere scraping of butter.

Middle Morning:

Water to drink, with added fruit juice (of tomatoes, or grapes 1 Tablespoonful).

Dinner:

Veal broth (or Bovril or Oxo) 2 fl. ozs.
Chicken : rabbit : lean ham or lean tongue : or pounded white fish : 1 oz.
Half a small potato (well mashed).
Cauliflower or Broccoli.
Milk pudding (made with half-cream milk) with arrowroot or plasmon cornflour, or with grape nuts, or with sponge cake : or as junket or blancmange : Remainder of half pint of milk to drink.

Tea:

Bread baked in oven in thin slices or Zwieback, with honey, Marmite or mere scraping of butter.
Sponge cake or sponge fingers or meringue cases.
Half-cream milk ($\frac{1}{2}$ pint) with added Casein 5–10 gms.
Radiostoleum 10 minims twice daily.

9. DIABETIC COMA AND ITS TREATMENT

Coma is a recognized complication of diabetes, and may occur as a result of neglect of proper treatment, but may be precipitated by any pyrexial condition, as this immediately increases the insulin requirements. The main symptoms are

drowsiness, passing into coma, with air-hunger, and the symptoms of marked dehydration (due in part to the preceding polyuria)—a feeble rapid pulse, dry skin and dry tongue, and low intra-ocular tension. Vomiting is sometimes a prominent feature and adds to this dehydration: abdominal symptoms, and particularly pain, may indicate an inflammatory lesion which has precipitated coma, but may arise as a result of the Ketosis ('the diabetic abdomen') and in these cases the symptoms subside within two to three hours of instituting vigorous treatment. The commonest type of coma is associated with marked ketosis, and the urine not only contains a large amount of sugar, but also acetone and aceto-acetic acid. Treatment here consists in giving immediately 50 units of insulin intravenously, followed by 1-2 pints of normal saline solution at blood heat, given intravenously over a period of 1 hour. If the patient is sufficiently conscious at the end of this time, 500 grams of glucose should be dissolved in four pints of half-normal saline, and this given in quantities of 100 c.c. hourly with as much additional half-normal saline as can be drunk; and 10-20 units of insulin given each hour until the blood sugar falls to 0.80 per cent. But if the patient is still unconscious, further intravenous saline in quantities of 1-2 pints must be given with 50 grams of glucose added, and with 30-50 units of insulin subcutaneously; and these repeated each 3-4 hours till consciousness returns. Then the intravenous glucose can be replaced by rectal glucose or by the half-normal saline with glucose by mouth, until with the control of the acidosis as shown by frequent examinations of the urine, milk, Bengel's food, etc. can be commenced. The advantage of this large volume of fluid is not only that it combats dehydration, but also washes out toxins via the kidneys. The less usual variety of diabetic coma is that with little or no ketosis, but with a diminution in the volume of urine, and finally a suppression, so the blood urea as well as the blood sugar give very high values. This 'anuric type' is in part due to the intense dehydration, but renal damage is also in part responsible. This more serious variety must be attacked by giving still larger doses of intravenous saline in doses of 3-4 pints in the first hour, with 50-100 units of insulin added to this infusion. Subsequently further intravenous glucose-saline (1-2 pints) with rectal salines must be given and with insulin 4-hourly until the urine is passed in adequate quantities again. In either type, the circulatory collapse must be treated by warmth and stimulants such as coramine, adrenaline and digitalin. (The doses of insulin quoted above are often exceeded when repeated blood sugar estimations are obtainable.)

HIGH CARBOHYDRATE DIETS FOR DIABETES.—Before the discovery of insulin it was the custom to give a diet with as little carbohydrate as possible, in fact only sufficient to

control ketosis (often only 20–30 grammes daily). In the early days of insulin therapy this was still continued, but it is now recognized that it is preferable to give a diet containing much more carbohydrate. This more closely approximates to the normal diet and is cheaper, it is much more palatable, it controls ketosis much more readily, and furthermore there is a much smaller tendency to the development of secondary infections. In children, in the presence of infections with tuberculosis or pyogenic organisms, and preparatory to operations, the high carbohydrate diet is essential, and it is remarkable that the total daily need for insulin is often smaller with the high carbohydrate diet than with the older low carbohydrate diet. It is now the custom to use 100–150 grams of carbohydrate daily, with protein in an amount of $\frac{1}{2}$ gram per pound body weight, and with fat to complete the calorie requirements. With these high carbohydrate diets, it is usual to give the insulin at least 30 minutes before meals. These diets have the additional advantage of keeping the blood cholesterol lower, and so lessening the tendency to develop arteriosclerosis.

10. THE USE OF SOME OF THE MORE IMPORTANT RECENTLY INTRODUCED DRUGS

AGAR-AGAR is prepared from Japanese sea-weed, and is particularly useful in treating constipation as it swells in the presence of water, and so promotes residue and intestinal peristalsis. It has no nutritive value, and is usually combined with liquid paraffin as an emulsion (B.P.C.).

AVERTIN is tribromethylalcohol, and is used as a basal anaesthetic in doses of 0.1 gm. per kilo body weight (maximum 10 gms.) per rectum (as 2.5–3.0% solution). It procures sleep in 20–30 minutes, and narcosis lasting 2–4 hours; it is usual to give nitrous oxide or open ether or some other volatile anaesthetic to procure deep anaesthesia. It is contraindicated in severe renal or hepatic disease.

CORAMINE is a proprietary preparation and is of use when administered hypodermically, intramuscularly or intravenously, particularly in shock, collapse and with cardiac weakness as it stimulates the heart, respiration and the central nervous system. The usual dose is 1 c.c., and can be repeated 4-hourly without cumulative or toxic effects.

EPHEDRINE was originally prepared from the Chinese plant Ma Huang; it has now been prepared synthetically, and is usually prescribed as the hydrochloride or sulphate. It acts in a manner parallel to that of adrenalin, by stimulating sympathetic nerve cells. It is used to relieve bronchial spasm, will raise the blood pressure in collapsed conditions (and so tend

to prevent post-operative thrombosis) and in Addison's disease. It may be administered by subcutaneous injection (*e.g.* $\frac{1}{2}$ gr. in 1 c.c.) or by mouth ($\frac{1}{2}$ -1 gr.).

EVIPAN SODIUM is a soluble barbiturate derivative. It is usually given intravenously (10 per cent. solution) in doses of 7-10 c.c. and rapidly produces narcosis sufficiently deep to allow of minor surgical operations, dental extractions, etc. over a period of 10-20 minutes.

FELTON'S SERUM is a concentrated antipneumococcal serum, of especial use with infections of Type 1 and to a less extent with Type 2 pneumococci. 20,000 units must be given intravenously as soon as the patient is seen, and provided that rapid bacteriological grouping confirms the presence of one of these two types of pneumococci, similar doses should be given each 6-8 hours on the first day and each 8-12 hours on the second and third days. The earlier the serum is given the more beneficial the results, but if given after the third day, no benefit will accrue. There is considerable evidence of a lowered mortality due to the use of this serum.

HALIBUT LIVER OIL is a potent source of Vitamins A and D, and as extracted from fresh halibut livers, contains 100-125 times the potency of cod liver oil for vitamin A, and 25 times the potency of cod liver oil for vitamin D. The daily dose for infants is 2-3 mins. (prophylactic) and 5-7 mins. (curative); and for adults 10 mins.

LIVER EXTRACT contains a specific anti-anæmic principle (see p. 644), which will cure the anæmia in a majority of cases. The daily dose is $\frac{1}{2}$ lb. of fresh liver or its equivalent as a dried liver extract, or 1 fl. oz. of liquid extract (B.P.). A reticulocyte crisis should start on the 5th day, and be maximal on the 8th or 9th day. If this does not occur, or if vomiting or diarrhoea are present, intramuscular or intravenous preparations should be tried (*e.g.* Hepatex, Hepastab), or stomach extracts used. The treatment must be persisted in until the hæmoglobin value is 100 per cent., if need be with iron therapy to complete this. A maintenance dose of the equivalent of 8-4 ozs. daily of fresh liver must be given, the dose being controlled by repeated blood counts. Highly concentrated extracts are now available (see p. 644).

LUGOL'S IODINE (Liquor Iodi Aquosus, B.P.C.) contains 5% of iodine in a watery solution of potassium iodide. It is given in doses increasing from 3 to 10 minims or more t.d.s., in cases of primary thyrotoxicosis: the pulse rate and general nervousness are lessened, and so it is used in the acute crises of this disease, and in pre-operative preparation for 7-10 days. It loses its effect if continued for more than 3-4 weeks, and may

then have no action if repeated later. Also the thyroid gland may become ligneous if long continued doses are given. It has no value and is contraindicated in secondary thyrotoxicosis (with adenoma), although sometimes given pre-operatively.

LUMINAL and Luminal Sodium (respectively Phenobarbitonum B.P. and Phenobarbitonum Solubile B.P.) are barbiturate compounds of value in epilepsy. A dose of $\frac{1}{2}$ – $1\frac{1}{2}$ grains t.d.s., usually in combination with bromide, will help to control severe cases, and this dose should not be exceeded except under strict medical supervision. If the fits occur at regular times of the day, the dose should precede these. In susceptible persons, toxic rashes and some pyrexia may occur. Single doses are sometimes given for sleeplessness due to anxiety, as there is no tendency to habit formation.

NEMBUTAL is a barbiturate derivative, used as a basal anæsthetic under the same conditions as avertin. It is sometimes combined with morphine gr. $\frac{1}{4}$ – $\frac{1}{8}$ and atropine gr. $\frac{1}{100}$, and is succeeded by nitrous oxide gas or some other volatile anæsthetic. It is given in doses of $1\frac{1}{2}$ –3 grs. by mouth (repeated later if necessary); 5–6 grs. per rectum; or intravenously as a solution of $7\frac{1}{2}$ grs in 10 c.c., in which case 1 c.c. is injected each minute until the required degree of narcosis is obtained.

CESTRIN (œstrinum B.P.C.) is an extract containing an internal secretion from the ovary. It is also contained in the placenta, and the urine of pregnant women; and has been synthesized. Trihydroxyœstrin is less potent than ketohydroxyœstrin: only the latter can be given by mouth. The chief value lies in its producing ovulation and menstruation in many cases of secondary amenorrhœa, in relieving the vaso-motor symptoms of menopause, in mitigating the premenstrual and menstrual types of migrainous headache, and it is said to be of value in relieving the pain of chronic mastitis. The usual daily dose is 1,000–2,000 rat units (usually 1–2 c.c.) hypodermically or intramuscularly, but much larger doses can be given without ill effect.

PARATHORMONE (Collip) is an active extract of the parathyroid glands, and acts by raising the blood calcium to normal or to excessive values. It is of especial value in controlling tetany, especially when this is associated with low blood calcium, and to a less extent in other conditions associated with nervous excitability, *e.g.* chorea. Overdosage produces vomiting at an early stage, and is a sign to reduce the dose. If given over long periods of time, a large intake of calcium is essential as otherwise the bones become decalcified (see p. 641). The usual dose for an adult is $\frac{1}{4}$ –1 c.c. once or twice daily, and if larger doses are given, these should be controlled by repeated blood calcium estimations.

PENTOSE NUCLEOTIDE.—*See* Agranulocytic Angina, page 630.

SALYRGAN is an organic compound containing 40 per cent. of mercury, and is a valuable diuretic. It may be given intramuscularly or intravenously (in 10 c.c. saline), in doses of $\frac{1}{2}$ –2 c.c., and is of especial value in cardiac and hepatic dropsy. It should be used with great care in renal dropsy, and never given in acute or advanced nephritis. The dose may be repeated each third day for three doses, and its effect is often enhanced if ammonium chloride (8–15 gms. daily) is given for 3–4 days previously.

SOLGANAL and Solganal B. oleosum (intramuscular) are salts containing gold in organic combination. They are of particular value in chronic infective conditions, especially in chronic infective arthritis after the infecting focus has been dealt with. The usual dose of the intramuscular compound is 0.05 gm., increasing each 4–5 days up to 20 gm. Twenty-four hours after each injection, some pyrexia and local reaction in the joints is often seen: the next dose should not be given until this and any albuminuria have subsided, and a total course of not more than 2.0 gms. given.

STOMACH EXTRACTS of Hog's stomach (*e.g.* Ventriculin) are of value in controlling the anemia of pernicious anemia, and may act when liver extracts are ineffective. They are also more potent in controlling the symptoms of subacute combined degeneration (see p. 649). The usual dose is 15–30 gms. daily, with 10–15 gms. as a maintenance dose.

THEOPHYLLINE SODIUM ACETATE is used to promote diuresis in cases of cardiac dropsy, especially when used in combination with digitalis: 2–4 grs. are given t.d.s., after meals, and often acts within a few hours. If no diuretic action is produced within 2 days, it is of no use continuing it.

11. ERYTHROEDEMA (PINK DISEASE) AND ITS TREATMENT

Erythroedema is a condition met in children, usually between the ages of 6 months and 2 years, although it may be met up to 6 years of age. Its chief symptoms are an irritable miliary rash on the trunk, and reddish-blue swollen cold hands and feet 'like raw-beef'; also extreme irritability, photophobia and insomnia, marked loss of muscle tone so that the child is unable to stand, a tendency to respiratory catarrh so that the disease is often ushered in by a pyrexial attack (often labelled as influenza), excessive salivation, and occasionally ulceration of the gums and cheeks. The cause is not known, but is believed to be due

to a deficiency of protein derivatives. Treatment consists in clothing the child with cotton or silk undergarments, and giving a good mixed diet: to supply the missing radiolos, raw liver (1-2 ozs. daily) or dried yeast (1 drachm t.d.s.)—not marmite—are given and ultra-violet light is of value.

12. HYPERPARATHYROIDISM. OSTEITIS FIBROSA DIFFUSA

When the parathyroid glands are removed, tetany is produced, with a low serum calcium (6-7 mgms. %). The condition of parathyroid tetany can be remedied by subcutaneous injections of the active hormone of the parathyroid glands (parathormone-Collip) and if sufficient be given this causes the serum calcium to return to normal (10.0-11.0 mgms. %). If an overdose is administered, symptoms such as vomiting and headache arise, with a serum calcium of 15 mgms. %. Further overdosage leads to great drowsiness and polycythæmia, and death when values of about 20 mgms. % of serum calcium are obtained. A clinical state of spontaneous hyperparathyroidism has now been recognized, in which the chief symptoms are vomiting, headache, lethargy and pains in the limbs. This is due in most cases to a cystic adenoma of one of the parathyroid glands, which may occasionally be felt as a tumour in the neck, or else to hyperplasia of all the four glands. The diagnosis is made by finding a high serum calcium value (13-16 mgms. %) and a low phosphate value: the high blood calcium is associated with excessive excretion of calcium and of phosphorus in the urine (sometimes leading to calcium phosphate calculi), and the output exceeds the intake ('negative balance'). To compensate for this the bones are depleted of their stores of calcium phosphate (general osteoporosis) and large cysts may occur in the place of the original bone (osteitis fibrosa cystica). The decalcification may lead to general collapse of the long bones, especially of the legs and of the vertebral column, and so multiple bony deformities with diminution of stature may arise. This condition is rectified if the overacting parathyroid gland is removed, when the blood calcium and phosphorus values return to normal, and if sufficient calcium and vitamin D be given, recalcification of the bones will occur.

13. THE DIAGNOSIS AND TREATMENT OF HYPOCHROMIC SECONDARY ANÆMIA

Hypochromic anæmia is essentially a disease of women during the child bearing period, and is rare after menopause. It is a common accompaniment of chronic abdominal invalidism, and may be associated with epigastric pain, nausea, vomiting, loss of appetite or diarrhoea. Accompanying these, achlohydria

is present in 80 per cent. of cases, and chronic superficial glossitis and dysphagia may be complained of. Physical examination shows some enlargement of the spleen in a number of cases, and blood examination reveals a low colour index anæmia with no abnormality in the white cells: the red cells are smaller than normal and are very pale (hence the name hypochromic). There is no evidence of increased hæmolytic or of gastro-intestinal bleeding. The treatment is by the use of large doses of iron salts. Iron and ammonium citrate should be given in increasing doses starting with 10 grs. t.i.d. and increasing to 30-40 grs. t.i.d. It may be given in a 50 per cent. solution, added to milk, or with glycerin and peppermint water thus:—

Ferri et ammonii citratis	...	...	gr. XL.
Glycerin	...	...	m XXX.
Aq. Menthæ Piperitæ	.	..	ad. 1 fl. oz. t.i.d.

If this produces a digestive upset it is useful to add liquor bismuthi citratis m XXX to each dose. Bland's pill in doses increasing up to 30 grs. t.i.d. may be used instead. This dosage must be persisted in for period up to three months, until the blood count returns to normal, and the treatment may have to be repeated in 1-2 years time if relapse occurs. The injection of iron either in the form of Fraise's serum or the official injection of the British Pharmacopœia is of no value.

14. THE KETOGENIC DIET IN THE TREATMENT OF JUVENILE EPILEPSY

For the major and the minor attacks of epilepsy, the ketogenic diet has proved of value in preventing attacks. This only applies in children, and the earlier the treatment is started, the more satisfactory are the results. The ketogenic elements in the diet are mainly contained in fats, while the chief anti-ketogenic elements are in carbohydrates and proteins. Normally the diet contains these in the proportion of K: A.K.: 1: 4. If this is changed to 1½: 1 this may be sufficient to control fits even when the urine shows no ketone bodies. If this is not sufficient the proportion may be raised gradually up to 4: 1, until control of the fits is complete. To construct a diet, the total calorie requirements are worked out by estimating the basal metabolic rate, adding 50% for normal activity, and a further 200 calories per day to allow for growth. The protein requirements are next estimated as 2/8 gram per lb. body weight. The amounts of carbohydrate and fat are then adjusted to give the requisite K: A.K. ratio. This diet can be taken for months, but needs to be supplemented with calcium lactate in view of the small proportion of calcium present. In the early stages weight is usually lost as dehydration occurs, but later growth

proceeds normally. As the co-operation of the patient is essential, there must be no marked mental deterioration, and in favourable cases the fits gradually cease and the mentality is markedly improved. The treatment may be combined with luminal, and possesses the advantage over large doses of bromides that there is no depressant effect.

15. THE TREATMENT OF LEAD POISONING

The administration of potassium iodide during lead poisoning has often resulted in more severe poisoning owing to the tissues being flooded by soluble lead iodide. During the acute stages of lead poisoning (with neuritis, encephalopathy, colic, etc.) the lead should be removed as rapidly as possible, and this is best attained by causing it to be stored in the bones as an insoluble salt. This is accomplished by utilizing the antagonism between lead and calcium salts, and so a high calcium diet (milk, eggs, green vegetables, etc.), with calcium gluconate (60 grs. t.i.d.) or calcium lactate (80 grs. t.i.d.) are given. By giving 10-20 c.c. of calcium gluconate (10%) intravenously, the pain of lead colic is rapidly overcome. This procedure of a high calcium dosage is maintained for several days after all toxic effects have subsided; then an attempt is made to eliminate the lead by giving a low calcium diet, and simultaneously either ammonium chloride (20-30 grs. four to six times daily) or by injecting parathormone (Collip) 15-25 units t.i.d. The lead is excreted within about 2 weeks, and in the face of the high concentration of soluble calcium present, further toxic symptoms do not arise.

16. THE TREATMENT OF MÉNIÈRE'S DISEASE WITH LUMINAL AND BY ALCOHOL INJECTION INTO THE SEMICIRCULAR CANALS

Ménière's disease is characterized by sudden attacks of vertigo, usually with a tendency to fall in some one direction, with vomiting, and is associated with tinnitus and progressive nerve deafness. The symptoms are due to acute labyrinthine irritation, or more commonly to progressive labyrinthine destruction. The attacks may be very sudden in onset and very violent; a patient may be suddenly precipitated to the ground, start to vomit in violent fashion, and it is not surprising that they are a great source of dread to the patient. The attacks will only cease with complete destruction of the labyrinth. Having excluded a local cause in the ear, such as Eustachian tube obstruction, luminal is by far the best drug to use. As the attacks are so irregular in onset, $\frac{1}{2}$ grain should be taken night and morning, but if need be a maximum dose of 8 grs. daily may be used. In intractable cases Mollison has advised complete destruction of

the labyrinth by exposure of the external semicircular canal on the diseased side, and the injection of $\frac{1}{2}$ –1 c.c. of absolute alcohol. After a few days the attacks subside finally, but with complete loss of hearing on the same side. He has successfully used the same procedure in cases of intractable vertigo after mastoid operations.

17. THE MODERN TREATMENT OF PERNICIOUS ANÆMIA

The treatment of pernicious anæmia has been revolutionized by the discovery of the value of liver, liver extracts and stomach extracts. In 1926, Minor and Murphy first described the use of liver in quantities of $\frac{1}{2}$ lb. per day in patients with pernicious anæmia, and since this time potent extracts have been prepared for administration by mouth, and later by subcutaneous, intramuscular and intravenous injection. The underlying principle is that, coincident with the lack of pepsin and hydrochloric acid in the gastric secretion, there is a lack of an 'intrinsic factor' in the secretion: this normally acts on muscle protein in the process of gastric digestion, and produces the effective hæmatinic principle. The muscle protein contains an 'extrinsic factor', which is also contained in Marmite, and the general consensus of opinion is that the extrinsic principle is closely allied to Vitamin B₁₂. Therefore the interaction of the 'intrinsic' and 'extrinsic' factors is necessary to form the anti-anæmic substance. Sometimes this substance cannot be absorbed in adequate quantities, especially in severe cases with enteritis, and injections become essential, especially in the earlier stages of treatment.

Whole liver has to be given either raw, or after cooking for not more than half a minute, or as a pulp, in quantities of $\frac{1}{2}$ lb. per day, later reduced to $\frac{1}{4}$ lb. per day: the liver of the ox is best, and is rather more satisfactory than that of the calf and sheep. These large quantities become very tedious, and liver extracts have been prepared as liquid and as dry extracts (B.P.) in amounts equivalent to $\frac{1}{4}$ lb. fresh liver per day. After administration, there should be a rise in the 'reticulocytes' of the blood (*i.e.* young red cells stained by azure-blue), to 20–30 per cent. on the 8th–12th day, followed by a rise in the hæmoglobin value. If this does not occur, extract of hog's stomach (*e.g.* Ventriculin 10 grammes daily) should be used and a similar rise in reticulocytes and in hæmoglobin looked for. It is becoming much more convenient and cheaper to give potent extracts intramuscularly, and this should always be used in severe cases (with an initial blood transfusion if necessary). Convenient preparations are Pernæmon Forte (initial dose 8 c.c. repeated each 4–8 weeks in doses of 5 c.c.) and Hepastab (initial dose 10 c.c. repeated each 2 weeks in doses of 2 c.c.): in either

case the maintenance dose should be regulated by the blood count. With these doses the reticulocyte rise commences on the third day but it is unusual for the blood count to rise to 100 per cent. without the addition of iron to complete the treatment. Treatment is not sufficient unless the hæmoglobin reaches at least 100 per cent., and this must be maintained by repeating the administration for the rest of the patient's life. It has been found that the best preventive to the subsequent occurrence of subacute combined degeneration is a hæmoglobin value constantly at or just above 100 per cent.

. A blood picture similar to that of pernicious anæmia can occur where the gastric juice contains an adequate amount of pepsin, hydrochloric acid and 'intrinsic factor', but where the 'extrinsic' factor is missing. This occurs in 'pernicious anæmia of pregnancy' and in sprue and coeliac disease. These are best treated by Marmite ($\frac{1}{2}$ oz. t.d.s. at first, reduced to 1 drachm t.d.s. as a maintenance dose) in warm water, or milk, or on bread and butter: or by liver extract. An initial blood transfusion is essential in severe cases: and in the pernicious anæmia of pregnancy, once the pregnancy is terminated, the condition automatically clears up and treatment can be discontinued.

18. LIPIODOL AND ITS USE IN PULMONARY DISORDERS

Lipiodol is a heavy poppy-seed oil with a large added content of iodine, which makes it opaque to X-rays. It is non-irritant, and by slowly giving off its content of iodine over a period of months, has the additional advantage of being antiseptic. Lipiodol may be introduced into the lungs through the mouth or the nose, after painting or spraying with a local anæsthetic, or in children through the crico-thyroid membrane, the usual amount used being 20 c.c. Immediately after its introduction, the patient must be put into the correct posture to ensure that the oil enters the required area: *e.g.* he must lean to the left or to the right to enter the corresponding lower lobes. To ensure filling of the upper lobes, immediately after introducing the oil with the head raised, the upper part of the chest and the head must be lowered. Subsequent X-ray examination in the antero-posterior, lateral, or oblique positions will reveal the distribution of the lipiodol. The normal picture obtained is one outlining the bronchi and showing the filling of the interstices of the lung in a finely flocculent manner. Obstruction to a bronchus by a foreign body, growth, etc. shows the oil retained behind the block, often forming a cone at the site of obstruction, and the lung field peripheral to this contains no opaque substance. The same appearance is met with in lung abscess, where the granulation tissue acts as an obstruction. In bronchiectasis,

the cavities normally fill with the lipiodol and show as cylindrical or saccular dilatations in relation to the bronchial tree: in so-called 'silent bronchiectasis' which may only reveal itself clinically by the occurrence of repeated hæmoptyses, its value is inestimable.

The opaque appearance to X-rays is also utilized in tracing the course of fistulæ and sinuses, either in the chest or elsewhere, by injecting the lipiodol into the lumen.

19. TREATMENT OF PROGRESSIVE MUSCULAR ATROPHY AND OF CERTAIN TYPES OF MUSCULAR DYSTROPHY WITH CALCIUM SALTS AND PARATHORMONE

PROGRESSIVE MUSCULAR ATROPHY may be slowed in its course, or may show long periods of improvement, in the face of calcium therapy. The cases that do best are those of peripheral type, with little or no involvement of the upper motor neurones. Treatment consists in giving calcium gluconate (60 grs. b.d.) before meals in a little milk: with parathormone (Collip) $\frac{1}{4}$ c.c., b.d. subcutaneously. In a case which reacts favourably, the patient has a feeling of well-being within the first 2-3 days, and measurement of the muscle strengths, *e.g.* the grip, will show a quantitative improvement within a month. Although the calcium salts are given continuously, we usually give courses of parathormone over a period of 2 weeks, with a period of freedom of 1-2 weeks until a second course is started. In Wording-Hoffmann's disease, two minim doses twice daily, with calcium and radiostoleum by mouth, restored one case of ours to complete health. In peroneal muscular atrophy and in amyotonia congenita, calcium salts with vitamin D by mouth have effected satisfactory improvement.

MUSCULAR DYSTROPHY has been benefited by similar treatment with calcium salts and parathormone injections, but cases of the pseudohypertrophic variety have, in our experience, usually failed to respond.

20. THE TREATMENT OF PULMONARY TUBERCULOSIS BY ARTIFICIAL PNEUMOTHORAX AND BY SANOCRY SIN

ARTIFICIAL PNEUMOTHORAX therapy undoubtedly constitutes a great advance in the treatment of pulmonary tuberculosis. The rationale of the treatment is that, if the diseased area of lung can be collapsed, it is thereby given physiological rest and so healing can ensue. In the process, a certain amount of auto-inoculation takes place, and if this is judiciously used,

the subsequent formation of antibodies will still further raise the patient's resistance. The main indications for collapse therapy are: (i) when the disease is unilateral, or very much more extensive, with recent infiltration, on one side as compared with the other; (ii) when unilateral cavitation is present in the more diseased lung; (iii) in cases of recurrent and severe hæmoptysis from one lung; (iv) when the patient is a young man, and especially a wage-earner, artificial pneumothorax is often resorted to at an early stage, especially if he has young children who may become infected; (v) a preliminary course of sanatorium régime is often given: then if the patient fails to react within 3-6 months, artificial pneumothorax therapy is resorted to. The main contraindications are: (i) this method of treatment is seldom used over the age of 45 years; (ii) when bilateral cavitation is present; (iii) when the disease is equally advanced and still progressive in both lungs; (iv) any high temperature or severe toxæmia is always a contraindication, but a slight temperature ($99^{\circ} - 99.5^{\circ}\text{F.}$) will often settle soon after the diseased lung is rested by collapse therapy.

As a preliminary to any collapse therapy, careful X-rays must be taken to show the extent and activity of the disease on the two sides. An initial period of rest in bed is often of great value, as the temperature falls, the general condition of the patient improves, and by repeated physical examination of the patient and monthly radiological examination, the progress of the disease in each lung can be studied. The patient should be given morphine $\frac{1}{4}$ gr. and atropine sulphate $\frac{1}{100}$ gr. before the induction is commenced. After thorough local anæsthesia has been obtained in a satisfactory position (usually the 5th intercostal space in the axilla), the needle of the artificial pneumothorax type is introduced, the style is withdrawn, and the excursions of the water manometer watched. When these indicate a negative pressure with a difference of 4-5 cms. of water between inspiration and expiration, the point of the cannula is in the pleural cavity. Filtered air is cautiously introduced until 200-800 c.c. have been inserted. Refills of 200-450 c.c. have to be given each 2-3 days at first, but as time goes on, less frequently, until a satisfactory degree of collapse is obtained (as indicated by the physical signs and by repeated X-ray screening). During the induction or refills, sudden collapse of the patient may ensue from (i) the cannula not being in the pleural cavity, but perhaps in a vein, (ii) pleural shock. After each refill a certain rise of temperature, with constitutional disturbance, will often occur, and no more refills must be given until these have subsided. Remote dangers are: (i) the strain on the other lung may cause recrudescence activity, or occasionally produce a spontaneous pneumothorax, (ii) the side of the artificial pneumothorax often develops a serous effusion which is of little signi-

fidance: occasionally a pyopneumothorax results. A satisfactory degree of collapse may be prevented by adhesions, or by the subsequent development of an obliterative pleurisy: but even advanced cases may show few adhesions, and satisfactory collapse may be obtained where it is least expected.

* This line of therapy may have to be persisted with for any period up to five years: not the least of its advantages is that regular refills will necessitate regular medical care. The mortality of cases with pulmonary tuberculosis has been materially lessened since this treatment was adopted, the danger to others considerably lessened by the diminution or abolition of sputum, and patients are very often able to resume work at an earlier stage, while persisting with the collapse therapy: but previous experience is essential before any practitioner embarks on it as a therapeutic agent.

SANOCRY SIN is a double thiosulphate of sodium and gold, and was first introduced on account of its property of permeating the fatty capsule of the tubercle bacillus, and so destroying the organism. It has been used less frequently in the last few years, but is of definite advantage in certain cases, especially those cases of chronic fibroid tuberculosis where there is a persistently positive sputum. Contraindications to its use are: (i) when there is any pyrexia over 100°F.; (ii) when marked constitutional symptoms and signs are present; (iii) in the presence of any serious complication, *e.g.* laryngeal tuberculosis, tuberculous enteritis, its use is absolutely forbidden. The usual initial dose is .08-.05 gm. dissolved in distilled water and injected intravenously. A slight reaction usually follows, with a temperature, loss of appetite, and after the larger doses, toxic albuminuria. Until such reactions have subsided, the patient must be confined entirely to bed, and further doses must be delayed until the patient has completely recovered from all effects of the previous dose. Usually at intervals of a week, the doses are cautiously increased to .10 gm., .15 gm., .25 gm., .40 gm., .50 gm., and finally to .75 gm. This latter dose is repeated twice, and then the course is complete. A further course may be given after a lapse of three months. An erythematous rash not infrequently develops after the larger injections: sometimes exfoliative dermatitis or a purpuric tendency will occur and will necessitate immediate cessation of this form of treatment.

21. RED BLOOD CELL SEDIMENTATION RATE AND ITS SIGNIFICANCE

For this test, blood mixed with sodium citrate is introduced into a graduated sedimentation tube placed in a vertical position in a rack. At the end of one hour, the amount of fall of the

red corpuscles below the top of the fluid is read. At the end of one hour the average degree of sedimentation is 2.0 mm., with an upper limit of 5.5 mm., the value depending on the ratio to one another of the various plasma proteins. The value is greatly increased in anæmia and pregnancy, is very low in the first year of life, and is affected by menstruation. With these normal variations in mind, the sedimentation rate is increased in a large number of pathological conditions, *e.g.* by almost any active inflammatory condition, and by neoplastic conditions. Its chief value is (i) in the diagnosis and prognosis of tuberculosis. A normal sedimentation rate always excludes active tuberculosis: in the course of pulmonary tuberculosis, a falling or rising sedimentation rate is a delicate index of subsiding or advancing disease; (ii) in the presence of active rheumatic carditis, an abnormal sedimentation rate is always met, so that with a normal sedimentation rate, a heart murmur is either due to an old and inactive condition or to one of functional or congenital origin; (iii) after the removal of a growth and the healing of the wound, a normal sedimentation rate will exclude active malignant disease; (iv) a simple or a malignant condition may be differentiated for whereas a simple gastric ulcer will give a normal value, a malignant ulcer will always give a raised value, and the more active the growth the greater the effect.

22. TREATMENT OF SUBACUTE COMBINED DEGENERATION

Subacute combined degeneration is a frequent accompaniment of pernicious anæmia, and may also be present in cases of microcytic anæmia. In the former, it is invariably associated with achylia gastrica, and no acid is secreted even under the influence of histamine. Since liver and liver extracts have come into general use for the treatment of pernicious anæmia, we have learned that while liver extracts will cure the anæmia of pernicious anæmia, often the nervous phenomena gets progressively worse, and the patient may become bed-ridden. This is much less common if the hæmoglobin is maintained at 100-105 per cent. Wilkinson has reported that patients with pernicious anæmia who are treated with stomach extracts rarely develop progressive subacute combined degeneration. Two effective lines of treatment have been developed in recent years. Sargent has shown that great improvement takes place if massive doses of iron are given. This occurs equally in the form associated with pernicious anæmia and in that associated with microcytic anæmia. In the former, with the subsidence of the nervous symptoms, the anæmia may get worse, while in the latter, the iron is equally good for both the nervous disease and for the anæmia. The iron is given in the form of Bland's pill, 100-150 grains a day for an initial period of 2-8 months, followed by a

maintenance dose of 40-50 grains a day. The weakness, paresthesia and powers of co-ordination are greatly improved, and a bed-ridden patient is enabled to walk again, but the extensor plantar reflexes remain. The other line of treatment is by the injection of extracts of *whole* liver (in the form of campolon 6-8 c.c. on alternate days) for 2-3 months, followed by whole liver (1½-2½ lbs. a week) associated with a diet rich in milk, eggs and green vegetables. Ungley has obtained dramatic results with this treatment in advanced cases.

23. THE TREATMENT OF TETANUS

It has been the custom to give antitoxic serum for the treatment of tetanus by the intravenous, intramuscular, and intrathecal routes, but of these the intravenous route is probably much the most valuable. The disturbance to the patient produced by the lumbar puncture is in itself a reason for using this as little as possible, and if a single very high dose of 200,000 units of antitoxin be used as soon as the patient is seen, there is no need to give the antitoxin by other routes; and an antitoxic activity can still be demonstrated in the patient's blood a month later. For this purpose the concentrated serum containing 3,000 or more units per c.c. should be used. To control the spasms, chloral or chloretone may be given per rectum in doses of 15-20 grains each 4-6 hours, or potassium bromide in doses of 200-300 grains in 24 hours. Avertin has been used in large doses (page 637).

The third point in treatment is the need for maintaining adequate nourishment. The exhaustion and acidosis from the frequent muscular spasms must be combated by giving concentrated foods by the rectum, by nasal feeding, or by a rubber tube inserted inside the cheek leading from a feeding bottle. Simple cleansing of the wound, and repeated irrigation with peroxide of hydrogen is the best form of local treatment.

24. RECENT WORK ON VITAMINS

Vitamins are essential food substances, the presence of which in minute proportions is necessary for normal health.

VITAMIN A. The chief effects of vitamin A deficiency are—(1) Gradual cessation of growth, and ultimately loss of weight and even death. (2) A decreased resistance with atrophy of mucous membranes (i) in the eye xerophthalmia and night blindness occur; the lacrimal glands cease to secrete and the conjunctiva undergoes a characteristic inflammation; (ii) in the respiratory tract keratinization of the mucous membranes leads to repeated bronchitis or broncho-pneumonia; (iii) the secreting glands of the digestive tract and the mucous membranes under-

go atrophy, enteritis readily occurs. (3) A diminished resistance with subsequent atrophy of the skin, so that sores, impetigo and napkin rashes are commonly met, and later the skin becomes inelastic, dry and atrophic. (4) A general diminution in resistance to infection occurs, especially during pregnancy and the puerperium. The vitamin is fat-soluble, and the pigment carotene is probably a precursor: it is contained particularly in cod liver oil, halibut liver oil, milk, butter, cream, eggs, and green vegetables.

VITAMIN B is a complex, water soluble vitamin, with at least two distinctive factors— B_1 and B_2 . Absence of Vitamin B causes cessation of growth. Vitamin B_1 deficiency produces beri-beri (see p. 32), which may exist in the 'dry' form where peripheral neuritis predominates, or in the 'wet' form with failure of the heart and circulation. Associated with these, there is cessation of secretion and of motility of the alimentary tract. Vitamin B_2 deficiency produces pellagra (see p. 204) with gastro-enteritis and glossitis, a characteristic skin eruption, mental apathy with tremors, and an ataxic or spastic paralysis. The treatment consists in giving milk, lean meat, eggs, beans and peas, wholemeal bread and unpolished rice, and dried yeast ($\frac{1}{2}$ –1 oz. daily).

VITAMIN C deficiency produces scurvy (see p. 246). This is met in children usually between 6 and 18 months of age, or in adults on a deficient diet (sailors, and occasionally with special diets, *e.g.* rigorous treatment of peptic ulcers). It is characterized by (i) hæmorrhage in connection with the bones, gums, alimentary tract, renal tract, and even in the post-orbital and cerebral tissues; (ii) pseudo-paralysis due to the pain in the limb; (iii) characteristic X-ray appearances of the bones with a 'ground-glass' appearance to the shaft and a clearer area adjoining the epiphysis. The vitamin has been synthesized and is known as ascorbic acid. It is contained particularly in fresh fruit juice (oranges, lemons, grapes, tomatoes, and in some limes), fresh milk, raw meat juice, and fresh green vegetables. It is readily destroyed by heat, particularly in the presence of oxygen, and in an alkaline medium (hence by sterilizing milk, and boiling green vegetables with soda).

VITAMIN D is a fat-soluble vitamin, essential for the normal absorption and utilization of calcium and phosphorus. In its absence, calcium and phosphorus are insufficiently absorbed and are also re-excreted without being utilized, and so (i) rickets with insufficient calcification of the growing ends of the long bones; (ii) tetany and its various manifestations; (iii) osteomalacia, especially in women during pregnancy and lactation, occur. The vitamin has recently been synthesized as calciferol, which is derived from irradiated Ergosterol: in the human skin

the ultra-violet waves can synthesize calciferol, hence the curative value of sunlight and of artificial ultra-violet waves. This vitamin is contained particularly in halibut liver oil, cod liver oil, butter and milk, or may be given as the pure substance. In a condition, such as coeliac disease, where fat absorption is poor, rickets can occur. If grossly excessive doses are given over long periods, excessive calcification arises, particularly in the lungs and kidneys.

VITAMIN E is known as the anti-sterility vitamin. In its absence, degeneration of the seminiferous tubules of the male, and cessation of pregnancy with abortion in the female, occur. It is contained in wheat-germ (wholemeal bread), in olive oil, and greens—particularly lettuce.

25. X-RAY INVESTIGATION OF THE URINARY TRACT WITH UROSELECTAN B

UROSELECTAN B is a pyridine derivative containing 51% of iodine, thus making it radio-opaque. 20 c.c. are injected into a vein, and radiograms taken immediately, 5, 15, and 50 minutes later. It is inadvisable to use this method where the renal function is grossly impaired, but no other ill-effects are to be found. The advantages of this method are many: thus, the rate and amount of excretion from each kidney gives a good idea of its functional activity: the normal outline of the pelvis of each kidney, the ureter and the bladder is shown, and the presence of any abnormality, such as hydronephrosis or an ectopic kidney, demonstrated. It possesses the advantage over ascending pyelography that no instruments (such as the cystoscope and opaque catheters) are necessary, and so the examination of cases with strictures, and with functional ureteric and urethral obstructions, is possible. This method should not replace ascending pyelography, but should supplement it: occasionally cases with intermittent hydronephrosis do not show any abnormality with this method, although such will readily be demonstrated by the ascending method.

EXAMINATION FOR LIFE INSURANCE

By F. W. BURTON FANNING, M.D., F.R.C.P.

CONSULTING PHYSICIAN, NORFOLK AND NORWICH HOSPITAL, AND
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In examining an applicant, the doctor should follow the ordinary methods of diagnosis to which he is accustomed, and whilst taking great pains to investigate the case, and to estimate the probabilities of life, he should avoid over-examination and potty details, reserving his energy for a comprehensive judgment of the case on all the points ascertained.

The Family History of the candidate is taken, partly to ascertain if early deaths of parents or of brothers and sisters form a striking and unexplained feature. But the chief point for attention is a history of Tubercular Disease. Unless the candidate is over forty years of age, and is free from any suggestion of such a tendency, the existence of Tuberculosis in a parent, or in more than one collateral relative, calls for an extra.

CONDITIONS WHICH SHOULD RECEIVE SPECIAL CONSIDERATION

OBESITY.—If obesity does not directly shorten life, it greatly increases the risks for disease, both acute and chronic. When a person's weight increases much above the average, and the abdominal girth exceeds the chest girth, an extra rating is indicated.

The experience of Life Offices emphatically warrants the declination of candidates whose weight is greatly in excess of the average.

THINNESS.—When the weight is much below the average, careful examination as to the cause is required, especially if the loss be progressive, as it may be due to malignant disease, diabetes or early tuberculosis. Unusual slimness does not, but leanness associated with feeble physique does, call for extra rating.

INTEMPERANCE.—No part of the examination calls for so much tact, professional acumen and discrimination, and the doctor should rely on his judgment rather than on the applicant's statements or the 'friend's' reports.

• • SYPHILIS.—With a history of Syphilis, the applicant is not taken at ordinary rates, until the Wassermann Test is negative, or until a year has elapsed since the last manifestation of the disease. According to some authorities even there a small extra is called for.

• GONORRHOEA.—If Gonorrhoea is completely cured, and no suspicion of stricture or other sequelæ exists, the case can be accepted at ordinary rates.

PREGNANCY.—Mortality in first pregnancies is high, and it is better to postpone the proposal until after confinement. If insured, the rating for primipara should be double that of multipara. Above thirty years of age, the risk is greater, and the rating should be further increased.

• ALBUMINURIA.—All cases connected with kidney or cardiac disease, or with a history of gout, rheumatism, or alcohol, must, of course, be rejected.

High blood pressure is often associated with albuminuria, and, if present, would determine the rejection of the life.

Cases in which albumen is detected in traces may be examples of the presence of pus, spermatozoa or urethral secretion in the urine. Other cases may be known to have existed for many years, without any detriment, and may be accepted after repeated examinations, at a considerably higher rating.

The renal efficiency tests should, however, be used in conjunction with blood-urea estimation.

The most frequently encountered form of Albuminuria amongst applicants for Insurance is the so-called Postural, Orthostatic or Adolescent Albuminuria. The chief point is that the urine of early morning is free from albumen, while that of the active day-time contains a trace. Strenuous exercise increases the amount of albumen present. The candidate is below thirty years of age and often belongs to a type characterized by poor physique, cold extremities and low blood pressure. If there is no other evidence of disease, these candidates can be accepted, according to most authorities. The detection of casts, other than a few hyaline casts, would denote actual disease of the kidneys.

In all doubtful cases, a microscopic examination of the urinary sediment should be made. The discovery of pus cells may indicate the cause of the albuminuria.

GLYCOSURIA.—In every form of actual diabetes, the risks are too great to justify acceptance.

If the glycosuria is clearly shown to be a temporary condition, and the proposer is elderly, the case might be accepted at enhanced rates.

The blood-sugar curve should, however, be examined. If while fasting hyperglycæmia exist, the risks are too great to justify acceptance. The sugar tolerance should be observed (Graham's Curves), and if normal, the mere presence of glycosuria need not affect the rating, according to some Examiners, but according to others, renal glycosuria may eventually lead to further disease.

SPECIFIC GRAVITY.—Remember that the Sp. Gr. of urine varies inversely with the temperature, and that it rises one point for every fall of 8 degrees of temperature. Persistently low Sp. Gr. may indicate contracted kidney.

TUBERCLE OF THE LUNG.—There must have been no suggestion of activity for five years, and, even then, a substantial extra must be charged.

PLEURISY.—After a lapse of five years, and with no other flaw, they may be taken with an extra.

EMPHYSEMA.—When associated with chronic or recurrent bronchitis, or asthma, should always be refused.

HEART DISEASE.—Aortic disease is more dangerous than mitral. Cases of aortic regurgitation and mitral stenosis can rarely be considered.

Cases with indication of muscular failure are uninsurable.

Cases in which compensation is so good as to conceal all evidence of circulatory defect, may be considered, at increased premium, for short periods.

GOUT.—A high extra rating is necessary, especially as the risk is an 'increasing' one.

According to modern conception, symptoms referable to the heart are of greater importance than signs such as the presence of a murmur, unless this denotes definite aortic regurgitation or mitral stenosis.

The Examiner should, therefore, satisfy himself that exertion causes no undue distress or shortness of breath. In case of any doubt, exercise tolerance should be tested.

In regard to the heart, the greatest difficulties surround the assessment of irregularity of action. While some forms of

arrhythmia are of no serious import, others are associated with grave cardiac lesions. The differentiation of these forms may call for the help of an expert cardiologist.

HERNIA.—This, with a suitable truss; Varicose Veins; Piles; and Fistula, without evidence of tubercle, do not demand any extra rating.

SPRUE AND CHRONIC DYSENTERY AND TROPICAL LIVER.—These should be refused, unless the cases are of a very mild type, and the patient likely to carry out efficient treatment.

MALARIA.—This does not call for extra rating, beyond the usual tropical rating, unless there is evidence of visceral changes.

CHRONIC OTORRHOEA.—This is regarded by all offices as demanding an extra to the premium. The amount depends on the character of the discharge, on its duration, and on the site of the perforation in the tympanum.

HEIGHTS AND WEIGHTS OF MEN AND WOMEN¹

*Heights and weights of Men and Women 16-54 years of age
(with clothes)*

MEN

Feet and inches, with shoes

Age	5-0	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	6-0	6-1	6-2	6-3	6-4	6-5
16	100	111	114	117	120	124	128	132	136	140	144	148	151	155	161	166	171	176
18	113	116	118	121	124	128	132	136	140	144	148	152	156	160	166	171	176	181
20	117	119	122	125	128	132	136	140	144	148	152	156	160	164	170	175	180	185
22	119	121	124	127	131	135	139	142	146	150	154	158	162	166	172	177	182	187
24	121	123	126	129	133	137	141	144	148	152	156	160	164	168	174	179	184	189
26	123	125	127	130	134	138	142	146	150	154	158	162	166	170	176	181	186	191
28	125	127	129	132	136	140	144	148	152	156	160	164	168	172	178	183	188	193
30	126	128	130	133	137	141	145	149	153	157	161	165	169	173	179	184	189	194
32	127	129	131	134	138	142	146	150	154	158	162	166	170	174	180	185	190	195
34	128	130	132	135	139	143	147	151	155	159	163	167	171	175	181	186	191	196
36	129	131	133	136	140	144	148	152	156	160	164	168	172	176	182	187	192	197
38	130	132	134	137	141	145	149	153	157	161	165	169	173	177	183	188	193	198
40	131	133	135	138	142	146	150	154	158	162	166	170	174	178	184	189	194	199
42	132	134	136	139	143	147	151	155	159	163	167	171	175	179	185	190	195	200
44	133	135	137	140	144	148	152	156	160	164	168	172	176	180	186	191	196	201
46	134	136	138	141	145	149	153	157	161	165	169	173	177	181	187	192	197	202
48	135	137	139	142	146	150	154	158	162	166	170	174	178	182	188	193	198	203
50	136	138	140	143	147	151	155	159	163	167	171	175	179	183	189	194	199	204
52	137	139	141	144	148	152	156	160	164	168	172	176	180	184	190	195	200	205
54	138	140	142	145	149	153	157	161	165	169	173	177	181	185	191	196	201	206

Allow 1 inch for shoes and 10 pounds for clothes

¹ Grateful acknowledgement is made to Dr. E. P. Joslin for the above tables from *Treatment of Diabetes Mellitus*, and the publisher Mr. Henry Kimpton

WOMEN

Feet and inches, with shoes

Age	1-8	4-9	4-10	4-11	5-0	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	6-0
16	102	104	106	108	109	111	111	117	120	121	128	132	136	139	143	148	153
18	104	106	108	110	112	114	117	120	123	126	130	134	138	141	145	150	155
20	106	108	110	112	114	116	119	122	125	128	132	136	140	143	147	151	156
22	107	109	111	113	115	117	120	123	126	129	133	137	141	144	148	153	157
24	109	111	113	115	117	119	121	124	127	130	134	138	142	145	150	154	158
26	110	112	114	116	118	120	122	125	128	131	135	139	143	146	151	155	160
28	111	113	115	117	119	121	123	126	130	133	137	141	145	148	153	157	161
30	112	114	116	118	120	122	124	127	131	134	138	142	146	149	154	158	162
32	113	115	117	119	121	123	125	128	132	135	140	144	148	151	156	160	164
34	115	117	119	121	123	125	127	130	134	137	142	146	150	153	158	162	166
36	116	118	120	122	124	126	128	131	135	138	143	147	151	154	159	163	167
38	117	119	121	123	125	127	130	133	137	140	145	149	153	156	161	165	169
40	119	121	123	125	127	129	132	136	139	143	148	152	156	159	164	168	172
42	120	122	124	126	128	130	133	137	140	144	149	153	157	160	165	169	173
44	122	124	126	128	130	132	135	139	142	146	151	155	159	162	167	171	175
46	123	125	127	129	131	133	136	140	143	147	152	156	160	163	168	172	176
48	124	126	128	130	132	134	137	141	144	148	153	157	161	164	169	173	177
50	125	127	129	131	133	135	138	142	145	149	154	158	162	165	170	174	178
52	126	128	130	132	134	136	139	143	146	150	155	159	163	166	171	175	179
54	127	129	131	133	135	137	140	144	147	151	156	160	164	167	172	176	180

Allow $1\frac{1}{2}$ inches for shoes and 8 pounds for clothes.

Notes.—(1) The average height and weight, in the majority of Indian races, is lower than that of Europeans. Buchanan gives the average weight of a Bengali at 109 lbs., and Lewis, of a U.P. man, at 110 lbs.

(2) Buchanan's formula for calculating the weight from the height is 5 feet=100 lbs., and add 8 lbs. for every full inch above 5 ft.; or in men over 5 ft. 8 ins., add 4 lbs. for each inch. Example: 5 ft. 6 ins.=100+8×6=118 lbs.

(3) The chest circumference should increase from $\frac{1}{4}$ to 1 inch with every inch in height, in men, between 5 feet and 6 feet 1 inch.

EXPECTATION OF LIFE

Table showing comparative expectation of life for males at decennial ages, as deduced from the results of the 1891, 1901 and 1911 Censuses, respectively, in the several Provinces specified, and over the combined area, with corresponding value for England.

Age	Bengal Presidency		Bombay Presidency		Madras Presidency		United Provinces	
	1891	1901	1891	1901	1891	1901	1891	1901
0	22.78	21.57	26.12	22.77	26.92	26.21	24.45	25.30
10	33.85	32.95	37.20	34.62	38.70	36.93	34.10	35.26
20	27.77	27.50	30.87	28.39	32.55	30.43	27.75	28.43
30	22.51	22.64	24.67	22.27	26.57	24.24	22.35	22.01
40	17.98	18.28	18.94	16.90	21.06	18.60	17.74	16.76
50	13.83	13.93	13.88	12.48	15.91	14.05	13.56	12.64
60	9.89	9.52	9.59	8.73	11.06	10.10	9.63	8.92
70	6.35	5.61	6.05	5.38	6.94	6.27	6.15	5.50
80	3.59	2.86	3.39	2.81	3.85	3.35	3.43	2.96
90	1.69	1.07	1.65	1.07	1.82	1.56	1.60	1.23

Age	Punjab		Burma		All-India		England	
	1891	1901	1891	1901	1891	1901	1891	1901
0	26.58	23.18	...	30.29	24.59	23.63	...	44.07
10	38.07	35.45	...	39.93	35.46	34.73	...	49.65
20	31.76	29.59	...	33.28	29.24	28.59	...	41.04
30	25.60	24.54	...	27.68	23.66	22.90	...	33.06
40	20.22	19.99	...	22.58	18.75	17.91	...	25.65
50	15.56	15.43	...	17.45	14.28	13.59	...	18.89
60	11.41	10.70	...	12.18	10.12	9.53	...	12.90
70	7.60	6.39	...	7.37	6.46	5.80	...	8.02
80	4.48	3.28	...	3.84	3.65	3.07	...	4.40
90	2.26	1.38	...	1.75	1.69	1.23	...	2.32

* Estimated values.

[N.B.—I am indebted to The Secretary, Economic and Overseas Department of the India Office, for the following report as to why the 'Expectation of Life' was omitted from the Indian Census of 1921.]

EXTRACT FROM REPORT ON THE AGE DISTRIBUTION
AND RATES OF MORTALITY DEDUCED FROM
THE INDIAN CENSUS RETURNS OF 1921 AND
PREVIOUS ENUMERATIONS

* * * * *

61. REASONS FOR OMITTING THE EXPECTATION OF LIFE.—The census figures, showing the total numbers living at ages over 70 in each community, were all included in the group 70 and over, and it was evident from an inspection of the sample schedules, which give the numbers living at each age out of about 100,000 in each of the various communities, that no useful purpose would be served by endeavouring to use those samples for the purpose of estimating the total numbers at individual ages over age 70. We, therefore, have to rely entirely on the particulars relating to ages under 70, to get an estimate of the rates of mortality for ages over 70. These latter rates, consequently, are not dependable. The same may be said of the rates under age 20, owing to the abnormal features in the age returns at infancy and round about age 15. This shortage, at the latter period of life, has been dealt with, as if it were due solely to misstatement of age. It may have been, but at infantile ages, I am so strongly of opinion that the shortage is due partly to non-enumeration that I have omitted to quote the rates of mortality for these ages, as not only would no useful purpose be served by doing so, but the rates, if published, might be misleading. I have also omitted to calculate the expectation of life. Not only is the expectation of life at each age under 70 dependant on the rates of mortality at all ages over 70, and, as stated above, these rates are not reliable, but the expectation of life at the time of birth, which is the one of most use in connection with census and public health problems, is affected in a very pronounced manner by any errors which there may be in the mortality rates at the infantile ages. If a comparison between the vitality of two different Indian communities be desired, it is, therefore, much safer to base it on the rates of mortality at the different ages, giving special weight to the comparison at those ages where the rates are reasonably dependable rather than on the expectation of life.

•SECTION VI

OBSTETRICS

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OBSTETRICS

By G. F. GIBBERD, M.S. (Lond.), F.R.C.S. (Eng.)

ASSISTANT OBSTETRIC SURGEON AT GUY'S HOSPITAL

ANTENATAL CARE

GENERAL HEALTH—The greatest advances in practical obstetrics of recent years have come from the gradual increase in antenatal care. Medical science should aim at the prevention rather than the treatment of disease, and in no sphere are the possibilities of preventative medicine so applicable as in Obstetrics.

It is now universally recognized that every pregnant woman should be under medical supervision, and the immense value of routine ante-natal care has now been conclusively proved. When first seen, the patient should be subjected to a general medical examination, so that any associated diseases may be discovered, at a time when it may be possible to institute effective treatment. No attempt will be made to discuss any specific disease in this connection, and, of course, it is unnecessary to stress the importance and value of early treatment. Quite apart from the discovery of disease, valuable advice can often be given to the patient with regard to general hygiene:—a subject where ignorance and superstition often take the place of common sense; but largely on account of the widespread publication of literature for the lay public, and partly because women are gradually realizing the value of ante-natal care, a more rational view of the hygiene of pregnancy is gradually becoming established.

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PRESENTATION OF FŒTUS.—The presentation and position of the foetus should be determined, and the foetal heart auscultated, in every patient during pregnancy. This is not so important in the early months, since, during this time, the foetus very frequently changes its position (1), and, furthermore, should labour start before a mal-presentation has been corrected, the maternal risks are, as a rule, much less serious with a premature foetus, than with a well developed one.

After the 32nd week, however, it is extremely important to diagnose any mal-presentation during pregnancy, so that

it may be corrected before the onset of labour. The diagnosis can be made in nearly all cases by abdominal examination; occasionally however difficulties arise, most commonly in breech presentations. In a primipara with a tight abdominal wall the head may be tucked away under the costal margin, and thus be inaccessible to palpation. A further difficulty may arise if the legs are extended (a common condition in primiparæ) so that the breech becomes engaged in the pelvis. In such cases, unless great care is taken, it is not difficult to mistake the breech, for a head that is well down in the pelvic cavity. These difficulties should be constantly borne in mind, since it is only by attention to them that mistakes can be avoided. If there is doubt as to the part which occupies the pelvis, a vaginal examination will nearly always clear up the diagnosis, since the presenting part can then be palpated directly through the fornices of the vagina. Even then it is possible to mistake the breech for the head, and in fact, the only characteristic of the latter is the presence of a suture, which can frequently be felt through the vagina and lower segment of the uterus. In some cases it may be impossible to be certain of the presentation, and if this is so, X-rays may be used to determine it (2). X-rays should however not be used indiscriminately in pregnancy, since their effect on the foetus is an unknown factor. For the purposes of diagnosis it seems improbable that they can do any harm, but it has been suggested that they may cause some developmental abnormalities in the foetus (3), and until this possibility can be definitely excluded, by experience gained over a large number of cases, it must be recognized as a possible objection to the use of X-rays as a diagnostic method during pregnancy.

If the foetus is found to be lying transversely or obliquely, there is practically never any difficulty in turning it into a head presentation, by gentle external manipulations. The difficulty lies in maintaining it in its new position. If the abdominal wall is lax a binder will often help, but it must always be remembered that the mal-presentation is liable to recur if the head is not engaged. For this reason patients in whom external version has been performed, should be seen at frequent intervals afterwards, until the head is engaged. Non-engagement of the head after a version will always arouse a suspicion of pelvic contraction, and should therefore receive attention from this point of view.

In breech presentation an attempt at external version should always be made, and if it fails (an uncommon event), another attempt under an anæsthetic is always justified. The dangers and difficulties of breech labour are so very much greater than when the head presents, that no patient should be allowed to

start labour with this unfavourable presentation, until every effort has been made to correct it during pregnancy—an effort which should be rewarded with success in well over 90% of cases (4).

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CONTRACTED PELVIS

In the treatment of contracted pelvis there are the following possibilities to be considered: (1) Delivery at full term per vaginam, with or without, instrumental aid. (2) Induction of premature labour. (3) Cæsarean Section, pubiotomy, or symphysiotomy. Prophylactic podalic version no longer has any place in the treatment of Flat Pelvis; since, even in a normal pelvis the foetal mortality in breech labour is very high, and, furthermore, the rapid moulding of the after-coming head in a Flat Pelvis, is specially likely to kill the foetus. Induction of premature labour should not be considered before the 34th week; because, among infants born before this time, the mortality during the first year of life is very high.

In the diagnosis of contracted pelvis there are the following methods to be considered.

MEASUREMENTS.—

EXTERNAL MEASUREMENTS.—These are taken because of the simplicity of the technique, but their significance is not very great. On the whole, it may be said, that a uniform diminution in all measurements suggests a generally contracted pelvis. If the Inter-spinous approximates to, or equals, the Inter-cristal, a Flat Pelvis is suggested.

Average Measurements	English cms.	Bengali cms.	Madras cms.
Inter-spinous ...	25	21	21.5
Inter-cristal . .	27.5	24.8	25.1
External Conjugate	20	17.5	18.4

INTERNAL MEASUREMENTS.—Although much more valuable in diagnosis, they are more difficult to obtain. They may be taken by an internal pelvimeter, such as Skutsch's; but for ordinary purposes, the diagonal conjugate can be measured fairly accurately by vaginal examination with two fingers. The

distance from the promontory to the lower border of the Symphysis Pubis is measured on the examining finger, and from this the true conjugate can be estimated by subtracting $\frac{1}{2}$ — $\frac{3}{4}$ inches. In a normal pelvis, it is unusual to be able to feel the promontory in this way, the maximum reach of most people being about $4\frac{1}{2}$ inches.

It is important to estimate the size of the pelvic outlet. This can be done by measuring the distance between the Ischial Tuberosities, and by examining the pubic arch. It is impossible, in actual practice to obtain accurate measurements of the angle of the pubic arch, but a rough classification into 'wide,' 'medium,' and 'narrow,' can be made. It is only recently that the importance of outlet contraction has been recognized; it was formerly thought to be a rare form of pelvic deformity, but it is now recognized to be a fairly common cause of dystocia. The danger of the condition lies in the fact that unless special care is taken to discover it, it does not make itself obvious until the second stage of labour, by which time, it may be too late to apply the most favourable treatment.

Average Measurements			cms.
True Conjugate	...	...	10.5
Diagonal Conjugate	...	...	12
Between Ischial Tuberosities	...	...	11
Angle of pubic arch	..	..	95°

THE FOETAL HEAD AS A PELVIMETER.—It is obvious that the possibility of disproportion between the foetus and the mother, cannot be excluded by examination of the mother alone; and for this reason, attempts have been made to measure the size of the foetal head 'in utero'. All these attempts have been of no practical value; but by comparing the size of the head with that of the pelvic inlet, we have a most useful method of diagnosis. In Munro Kerr's Method two fingers of the right hand are introduced into the vagina, and an attempt is made with the other hand to make the head enter the pelvic brim, by pressure from above. The vaginal fingers estimate the amount of descent, while the thumb of the right hand estimates the amount by which the head overlaps the symphysis.

TRIAL LABOUR.—In cases where it is doubtful whether any gross disproportion exists, it may be advisable to allow the patient to start labour, so that the effect of uterine contractions may be seen. After some time in labour a much better idea as to the relative sizes of the head and the pelvis, can be obtained. If this test is applied, and after some hours

in labour, it is decided that the disproportion is excessive, Cæsarean Section may be performed only if the most scrupulous care has been taken to avoid infection. This practically prohibits vaginal examinations in these cases, and certainly any more elaborate interference 'per vaginam'. If it is found that insuperable obstruction exists after a trial labour has been in progress, and there is any possibility of the lower genital tract being infected, craniotomy should be performed, on account of the high fetal mortality associated with Cæsarean Section in such cases.

The Ante-Natal treatment of a pregnant woman with a view to detecting, and treating, contracted pelvis, should therefore consist of:—

- (1) Routine pelvic measurements.
- (2) An examination to see if the head is engaged at the 34th week of pregnancy.

If the head is not in the pelvic brim, an attempt should be made to make it engage simply by pressure from above, and if this fails, an examination by Munro Kerr's Method should be undertaken. It is entirely a matter of judgment whether the head will go through the brim, or not; since the forces of labour may safely expel a foetus, which cannot be made to enter the pelvis by pressure from above. If it is decided that the head will go through the brim at the time of examination, but that it will not do so at full-term, the alternative procedures are induction of premature labour, or Cæsarean Section at full term. The choice of method depends upon the circumstances of the case. In ideal surroundings Cæsarean Section has a maternal mortality of 1-2 per cent., and offers the best chance for the child. Induction of labour requires less elaborate technique, and less operative skill; but the dangers of sepsis are perhaps greater than in Cæsarean Section, and it should never be attempted except under perfect aseptic conditions. The introduction of Quinine, as a method of inducing labour is certainly a very valuable advance, since it is free from the risks and disadvantages of operative induction. Its limitation lies in its uncertainty. Krause's bougies are employed in operative induction, but more recently other foreign bodies have been introduced into the uterus to stimulate contractions, *e.g.* a soft rubber stomach-tube; or a sterilized sheep's bladder filled with glycerine. Horrocks's rubber bag is also widely used for the purpose.

If it is found that the head can be made to engage at the 34th week, the patient is seen again at the 36th week, and a precisely similar examination is carried out. These examina-

tions are repeated at fortnightly intervals until full-term. If, at any time, it is decided that the head will not go through the brim at a later date, the alternatives of Cæsarean Section at term, or induction of premature labour, are considered as before. In this way it is possible to decide the treatment in most instances (and in the majority of cases, no interference is required); but there will still remain a few cases, in which it is impossible to decide whether the child can be born naturally or not. It is in these cases that a 'trial labour' may be resorted to.

In the diagnosis of disproportion pelvic measurements are of secondary importance to the method of Munro Kerr; but they will often give valuable help in deciding upon the method of treatment, in border-line cases. Where the measurements point to gross contraction of the pelvis, there is, of course, no difficulty in diagnosis.

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URINE EXAMINATION.—The examination of the urine is one of the most important investigations that has to be carried out in all pregnant women. It should be done at least once a month, preferably once a fortnight, during the latter half of pregnancy. If albumin is found, it should be examined microscopically for pus cells, since a *B. Coli* infection of the urinary tract is common in pregnancy. In the absence of pus (or if the albumin is present in an amount greater than would be expected from the amount of pus), the albuminuria is of serious import.

It is most probably due to one of two diseases; *i.e.* Chronic Nephritis or Pregnancy Toxæmia, and a differential diagnosis can usually be made from a consideration of the length of the history, the state of the cardio-vascular system, the state of the Fundus Oculi, and the chemistry of the blood and urine. It is uncommon for patients with well-marked Chronic Nephritis to become pregnant, and if they do, they usually abort early; but occasionally pregnancy progresses to the later months. The dangers which a patient with advanced Bright's Disease runs when she becomes pregnant, are so great that no hesitation should be allowed, in terminating pregnancy at the earliest possible moment.

In pregnancy toxæmia the main object of treatment should be to avoid eclampsia. We may therefore consider three degrees of severity, in this disease.

MILD CASES.—In which the patient complains only of œdema, or in some cases even this symptom may be absent. On examination the urine contains albumin ($\frac{1}{2}$ to 3 parts per 1,000), and the blood pressure is under 180 mm. Such a patient should be confined strictly to bed. A saline purgative should be given daily. No meat is allowed in the diet. Copious drinks are taken; and a diuretic is given (Pot. Cit., gr. xl, t.d.s.).

MODERATE CASES.—In which œdema is more marked, headaches and possibly eye symptoms appear. The urine contains as much as 6 parts per 1,000 of albumin, and the blood pressure may be raised to 160 mm. In addition to the treatment carried out in the mild cases, such a patient should be on a strictly farinaceous diet.

SEVERE CASES.—In which, in addition to the previous symptoms, severe headaches and eye symptoms appear. The blood pressure may be as much as 200 mm., and the urine may go solid on boiling. In these cases no food should be given but water and sugar. If no sugar is given the patient may become seriously ill from the ketosis resulting from starvation, so that it is an advantage to give large quantities of sugar in the form of sweet lemonade. In addition to the treatment advised in the moderate cases, the colon should be washed out with large quantities of 2% Sodium Bicarbonate solution.

It is justifiable to continue treatment in any case of albuminuria, so long as rapid improvement takes place, and the best indications of progress are obtained from a quantitative estimation of the albumin in the urine by Esbach's Tubes, and from the blood pressure.

Many attempts have been made to foretell the imminence of Eclampsia by chemical examination of the blood. All these investigations, though yielding valuable information about the metabolic alterations which occur in these patients, have given little practical help in deciding when to terminate pregnancy, and at the present time there are no indications so reliable as the blood pressure and such symptoms as severe headache, and eye symptoms.

If any case of albuminuria fails to respond rapidly to treatment, there should be no hesitation in terminating pregnancy. Labour may be induced by Quinine Sulphate, or by one of the operative methods. If strict antenatal supervision of all pregnant women is carried out, and treatment instituted for albuminuria, the incidence of eclampsia can be greatly lessened.

Indeed, except for fulminating cases, eclampsia should be a very rare disease in a well-organized practice.

TREATMENT OF ECLAMPSIA.—

SURGICAL TREATMENT.—On the grounds that the placenta is the source of the toxæmia, it has seemed advisable to some obstetricians, to terminate pregnancy as rapidly as possible. Forcible delivery 'per vaginam' before the cervix is fully dilated, is however attended by such a high maternal mortality, that it is now universally condemned throughout the practice of midwifery. A much safer way of emptying the uterus rapidly is by Cæsarean Section, but where this method has been applied in Eclampsia, the results have been bad, and it has recently been shewn that the mortality of 'mild cases' is about 10%, and of 'severe cases' about 40%, when Cæsarean Section is performed. Less drastic surgical procedures, such as induction of labour, or forceps delivery after full dilatation of the cervix, are however by many authorities, considered advisable; but they are to be used only in conjunction with medical treatment.

MEDICAL TREATMENT.—This is directed to (a) the control of fits, (b) the elimination of toxins, (c) accessory treatment.

(a) There is no doubt that the fit itself causes very considerable damage in a patient already desperately ill from toxæmia, and every effort should be made to lessen their frequency. Strogenoff believes that practically no treatment should be given except with a view to preventing convulsions. In addition to excluding all external stimuli as far as possible, he employs chloroform, morphia, and chloral in large doses; practically to the exclusion of all eliminative treatment, and claims results that are equalled by no other method. Many authorities believe that chloroform should not be used in large quantities in these cases, on the theoretical grounds that it is likely to increase any liver damage already present, and are content with morphia (gr. $\frac{1}{4}$ which may be repeated 4 hourly), and chloral by mouth or rectum.

(b) Elimination of toxins by the alimentary tract is carried out by giving large doses of saline purges; and in addition colon wash-outs are administered at 4 hourly intervals. If the patient is unconscious, the stomach is washed out, after which the purgative, and 1-2 pints of fluid, are introduced into the stomach through the tube. The kidneys are stimulated to function by the administration of fluids; in a conscious patient water may be given by the mouth in large quantities. If the patient is unconscious, it may be administered by the stomach-

tube or by continuous subcutaneous injection. The rectal route can seldom be employed on account of the diarrhoea due to the purgatives. Intravenous saline has the disadvantage that a large quantity has to be given over a short period, but it probably does not raise the blood pressure to any great extent for very long—an objection which is sometimes raised. Sweating is encouraged by means of hot packs, with the object of eliminating toxins by this route; but some obstetricians consider that the toxins are not excreted in the sweat, and that sweating tends only to concentrate toxins in the tissue fluids; and is therefore harmful. Venesection to the extent of 10 oz. may be performed, but there is always the possibility that the patient may have a post-partum hæmorrhage, in which case this operation will, of course, be regretted.

(c) Among the very numerous accessory drugs which have been used, mention will be made of only one. *Veratrum Viride* has the effect of lowering the blood pressure in eclampsia, and has been extensively employed.

Whereas 20 years ago the treatment of Eclampsia was directed mainly to emptying the uterus as quickly as possible, there has been of recent years a change to more conservative methods. This is seen in its extreme in Stroganoff's treatment. The so-called 'Dublin Treatment' probably represents the middle course, which is adopted most widely, with minor modifications. It relies mainly on eliminative measures, in addition to which moderate doses of narcotics are administered, and minor obstetric interference is carried out where necessary.

The relative merits of the various forms of treatment were very fully considered by a Committee appointed by the Section of Obstetrics and Gynæcology of the Royal Society of Medicine, London.

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ANTE-PARTUM HÆMORRHAGE

Ante-partum hæmorrhage is one of the most alarming accidents that can happen to a pregnant woman. It is true that some cases result in no harm, and require no treatment, but it is often impossible to determine the course of the hæmorrhage at its onset. For this reason every case of bleeding before the birth of the child must be looked upon as a potentially serious condition, and must be treated with the utmost care.

Before treatment is instituted it is important, if possible, to make a diagnosis as to the position of the placenta. Abdominal examination will often help, since a mal-presentation or a non-engaged head, suggests the presence of a placenta in the lower segment; but the diagnosis rests ultimately upon demonstrating the presence or absence of the placenta in the lower segment, upon vaginal examination. Gordon Ley emphasized the importance of the association between toxæmia and accidental hæmorrhage, and considered that the presence of albumin in the urine, in cases of ante-partum hæmorrhage, was strong evidence that the bleeding was from a placental site situated in the upper segment; but recently it has been shewn that this sign is not always of value in the differential diagnosis, since albuminuria may occur in placenta prævia, and be absent in accidental hæmorrhage.

In concealed accidental hæmorrhage the most striking sign is woody enlargement of the uterus, which is tender all over, and which gives rise to continuous pain. The fetus is usually dead. The general signs of blood loss are usually very striking, although it is not uncommon for the pulse to be disproportionately slow; a fact which, if not recognized, may lead the surgeon to imagine the patient's condition to be less serious than is really the case.

In spite of the large amount of work that has been done we are still ignorant as to the cause of this disease, and, indeed, some observers consider that accidental hæmorrhage is not a pathological entity at all, but may represent the result of a number of different morbid processes.

Nothing new has been added to our knowledge of the ætiology of placenta prævia since it was shewn that multiparity and endometritis favour its occurrence. It is now generally admitted that it may be due either to primary low implantation of the ovum, or to development of the placenta in that part of the chorion which is in relation to the decidua capsularis.

In accidental hæmorrhage, provided the loss is small, is abating, the patient is not in labour, and there are no signs

of concealed hæmorrhage, it is justifiable to give sedatives such as Chloral and Potassium Bromide, or Morphia, and to keep the patient at rest, in the hope that the bleeding sinuses will thrombose, and that no further separation of the placenta will occur. In this way the patient may have a normal spontaneous labour at some later date; but if this line of treatment is adopted, the patient must be kept under strict supervision throughout, since a further hæmorrhage may take place suddenly at any time later.

If the patient is in labour, or if the amount of blood lost is great enough to warrant more active treatment, several methods are available.

Rupture of the membranes, followed by the application of a tight binder is sufficient in mild cases, especially if good uterine contractions are occurring. Some authorities advise the use of Pituitary Extract as an additional measure in those cases; but there is always the objection that it may cause irregular muscular action on the part of the uterus, and even rupture of the uterus. This latter catastrophe is of course very rare in the absence of definite dystocia; but it must be remembered that, in accidental hæmorrhage, the uterine muscle is often diseased, and therefore more than usually liable to give way under the strain of labour. In view of this objection, Pituitary Extract if used at all in this condition, should be reserved for the less severe cases where there is no concealed hæmorrhage.

Where the bleeding is more severe, and the patient is in labour with a partially dilated cervix, it is sometimes advisable to perform bi-polar version, and pull down a leg, as being the most effective way of stimulating uterine contractions, and of hastening delivery and obtaining permanent retraction.

The cases in which the patient is not in labour and the cervix is not dilated, but in which hæmorrhage is severe, are very difficult to deal with; and in this group are included the majority of those in which there is considerable concealed hæmorrhage. Uterine contractions are difficult to excite on account of the paralytic state of the uterine muscle; yet it is in these cases that it is so important to obtain efficient contraction and retraction. It is here that vaginal plugging is of such value, since if efficiently performed it will usually arrest hæmorrhage, and at the same time stimulate uterine contractions; but it is an operation that must be very carefully performed under an anæsthetic, and there is a real risk of sepsis following, if the most careful aseptic technique is not observed.

In cases of concealed accidental hæmorrhage where the uterus cannot be stimulated to contract, the best treatment

is Cæsarean Section, and this may have to be followed by hysterectomy if the uterus will not retract after it is empty. Cæsarean Section should, however, not be performed unless the general condition of the patient is good; since it is obviously futile to embark upon a severe operation, when it is clear that the patient's general condition is too poor to stand it. Such cases tax the judgment of the obstetrician to its utmost; but very often by keeping the patient absolutely at rest with Morphia, the bleeding may cease and recussitative measures may be employed; so that, perhaps 24 hours later, a previously moribund patient may deliver herself of fœtus, placenta, and retro-placental clot, with practically no further bleeding.

The principle involved in the treatment of placenta prævia is firstly to stop the bleeding by pressure; and secondly to give the patient the best possible chance to recover her strength, after what is often a very severe hæmorrhage. In cases where the placenta is some little distance from the internal os, and the patient is in labour, it is usually sufficient to rupture the membranes, and to apply a tight binder to the abdomen. In this way the head compresses the placental site and effectively controls the bleeding.

In more severe cases where the edge of the placenta overlaps the internal os, the treatment depends largely upon the amount of dilatation of the os. If it will admit two fingers, the best treatment is bi-polar version by the method of Braxton Hicks. Some obstetricians prefer to perform external version, followed by bringing down a leg, on the grounds that the manipulation necessary is less, in this latter method. Bi-polar version has lately fallen into disrepute in some quarters because it is not always skilfully performed; but this is a criticism of the operator, rather than of the operation. If it is done by a skilful surgeon, it involves the minimum of disturbance to the uterus and placenta, and is therefore, in such hands, the operation of choice. The use of Champetier de Ribo's bag is attended with slightly better results to the child—probably at the expense of the maternal prognosis. The technical difficulties associated with its preparation are so great as to limit its use to certain cases in hospital.

In cases of central placenta prævia, version may be performed; but under favourable conditions the best results are obtained by Cæsarean Section, it must always be remembered, however, that this operation has its limitations, and these will be considered in another place (*see* Cæsarean Section).

If the cervix is not sufficiently dilated to allow of a version, or of the insertion of a bag, and there are contra-indications to Cæsarean Section, the only method of bringing pres-

sure to bear on the placental site is by plugging the vagina; and in suitable cases, this is a very valuable method.

When the bleeding has been arrested by one of the above methods, the general condition of the patient must be attended to. Warmth must be applied by hot blankets, hot bottles, and in some cases by the 'electric cradle' if this is available. Warm drinks are given as often as possible, and the patient is kept quiet with Morphia.

After an acute hæmorrhage it is very important to make up the blood volume as rapidly as possible. In some cases it is sufficient to give fluids by mouth, and perhaps also by rectum, but if the pulse is poor in volume, fluid should be given intravenously. The experience gained in the Great War has entirely altered our outlook on shock and hæmorrhage, and it has been conclusively shewn that there should be no delay in bringing the blood volume up to a normal amount. For this purpose blood is the best fluid, and now that the technique of blood transfusion has been so simplified, it should be used whenever the bleeding has been severe. If blood is not available the intravenous injection of Gum Acacia in normal saline as advocated by Bayliss is very valuable. Its administration is as simple as the injection of ordinary saline, and it is much more effective in raising the blood pressure.

By these methods the patient may regain her strength, and become fit for the labour, which should be allowed to proceed naturally, and not hurried in any way. It is not until the third stage of labour that the danger of hæmorrhage occurs again. For this reason everything should be ready in case of emergency, so that, should it occur, the bleeding may be quickly controlled by the usual methods. As a matter of fact the third stage is usually uneventful, but owing to the seriousness of even a small post-partum loss in these patients, it is very important to take no risks.

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CÆSAREAN SECTION

At the present time the only method widely used in Cæsarean Section is the trans-peritoneal route; but by this approach the uterus may be opened either in the upper segment, or in the lower segment.

In the classical operation, a vertical incision is made in the upper segment, and little has been added to the technique of the operation of recent years. Attention has been paid mainly to the suture of the uterine wound, and many different methods of performing this part of the operation have been advocated, but some of these are unnecessarily complicated; and good results are obtained by simple interrupted catgut sutures through the whole thickness of the uterine wall, followed by a continuous Lembert suture through the peritoneal coat, to bury the first line of stitches. The modern technique of such an operation is to be found in most text-books. The causes of rupture of the scar have been investigated, with the result that sepsis and ineffective suturing are now regarded as the most important factors, in the predisposition to this accident.

In America and the Continent of Europe the lower segment operation, has been in favour for a number of years, and recently in England it has become more popular. The abdomen is opened by a sub-umbilical incision, the bladder is dissected off the uterus, the upper peritoneal cavity is packed off by gauze, and the lower uterine segment is then incised either vertically or horizontally. The foetus is then delivered through this incision, either by the obstetric forceps or by pressure from above, the delivery of the placenta follows, and the incision is then closed in layers. The details of the operation vary with different operators, but the principle of confining the manipulations, and the escape of liquor amnii, to the lower part of the peritoneal cavity, is the same in all cases.

The advantages of this operation over the classical Cæsarean Section are: (a) The wound is in a part of the uterus that is not continually contracting and relaxing, and is therefore more likely to heal firmly. (b) The greater part of the peritoneal cavity can be effectively packed off from the operation area, and is therefore less likely to become infected from the escape of liquor amnii, etc., in cases which are not absolutely sterile. (c) The wound is closed in layers, the incisions in which do not directly overlap one another. (d) A small transverse suture line in the utero-vesical fold, is the only wound on the visceral peritoneum; and is much less likely to become adherent to other abdominal viscera, than is the suture line in the classical operation. (e) Owing to the fact that the escape of liquor amnii and blood into the general peri-

toneal cavity is under control, there is a minimum of abdominal distention and discomfort after the lower segment operation. The main objections to the operation are that it takes much longer to deliver the foetus, and that it is certainly a more difficult operation than the classical one, especially if the lower segment has not been well developed by labour pains; and it has yet to be shewn conclusively that the lower segment scar is more secure than one in the upper segment. There is no doubt, however, that where Cæsarean Section is indicated, and at the same time there is a possibility of infection of the interior of the uterus, it is by far the less dangerous operation; and it is in such cases that its use is likely to become universal.

The indications for Cæsarean Section have become increasingly numerous of recent years; but at the same time the limitations of the operation have become increasingly obvious; and although it is now employed for a large number of different abnormalities, it is, nevertheless, probably performed less frequently than was the case a few years ago. In unskilled hands the results of its indiscriminate use are appalling, and its abuse can only bring discredit upon what is undoubtedly a very valuable operation. For this reason many authors have lately emphasized the dangers, rather than the advantages of Cæsarean Section. It must be realized that, being a skilled surgeon is not sufficient qualification for performing Cæsarean Section. It is just as essential to be an experienced obstetrician, since the difficulties of deciding in which cases to perform the operation, are sometimes far greater than the technical difficulties of the operation itself.

The more common indications for Cæsarean Section have been considered elsewhere (Contracted Pelvis, Ante-partum Hæmorrhage, Eclampsia), and the limitations mentioned. The results of Cæsarean Section for various indications have been very carefully analyzed by Holland and Kerr, and a consideration of the figures quoted by these writers, makes it quite clear that Cæsarean Section is a dangerous operation where the general condition of the patient is poor, or where the interior of the uterus is infected before the operation. So long as the dangers of the operation are kept in mind, and the indications are decided by an obstetrician of experience, Cæsarean Section is an invaluable operation; but its abuse is productive of a very great amount of harm.

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PUERPERAL SEPSIS

It has now been abundantly proved that the most common cause of the infection in fatal cases of Puerperal Sepsis is the Hæmolytic Streptococcus. It has been shown further that this organism is only rarely present in the vagina before labour, and that most of the cases of Puerperal Sepsis due to the Hæmolytic Streptococcus are probably the result of introduction of the organism from without. This is a very important step forward in pointing the way to prophylaxis, and a large number of investigations has been carried out with a view to finding the normal habitat of these organisms. Their existence in obvious streptococcal lesions (Scarlet Fever, Tonsillitis, Erysipelas, etc.) is self-evident, but attention has recently been focussed upon certain healthy individuals who may be 'carriers' of the Hæmolytic Streptococcus in the nose or throat. In some cases it has been proved beyond doubt that the source of the puerperal infection was the throat of the attendant, and it has been suggested that the infection was conveyed by means of 'droplets' of saliva. Some observers are inclined to think that this 'droplet infection' is the most important of all possible methods of infection with Hæmolytic Streptococci. Others consider that the dangers of droplet infection have been exaggerated. At the present time the issue is still undecided—but the possibility is established beyond all doubt.

Apart from the Hæmolytic Streptococci, many other organisms may cause puerperal infection, but as a rule the infection in these cases is not likely to be so severe. Investigations show that these other organisms may be present in the normal vagina before the onset of labour, so that it is quite possible that many of these infections (with organisms other than the Hæmolytic Streptococcus) may be endogenous in origin. There is some evidence to show that excessive trauma, by diminishing local resistance, may be a big factor in determining the fact of infection.

PROPHYLAXIS.—It is well known that a hæmolytic streptococcus indistinguishable from the type causing puerperal sepsis may be present in the throat of apparently healthy persons, so that it is not sufficient merely to exclude those with clinical sore-throats from midwifery practice, but in every case to guard against the attendant being a 'carrier'. In speaking and still

more in coughing, a stream of fine particles of saliva is ejected on to surrounding objects—gloves, dressings, the skin of the vulva, etc.—and if pathogenic streptococci are present in the throat, they may be carried along with the droplets of saliva. A properly constructed mask (twelve to sixteen thicknesses of gauze) worn over the mouth and nose is an efficient protection against the risk of droplet infection—and this precaution should not be neglected. The accoucheur should employ the ordinary aseptic methods in conducting the labour; vaginal examinations should be reduced to a minimum and performed under the strictest aseptic conditions; in cases where interference is required, every effort should be made to avoid injury to the tissues of the birth-canal; aseptic pads should be applied to the vulva after delivery, and in the puerperium they should be changed by a nurse who is familiar with the principles of asepsis; vaginal douches should be avoided except in special instances, since they are more likely to carry infection into the vagina than to remove it.

If a case of sepsis occurs, in the interests of other patients, the most rigid isolation must be carried out. It is not sufficient to make use of the so-called 'disinfectants,' but the infected patient must be kept from contact, direct or indirect, immediate or remote, with other pregnant and puerperal women.

If these precautions are faithfully carried out, there is no doubt that the incidence of sepsis can be definitely lessened; but even then it will still remain as a possibility, and occasionally in spite of the most careful precautions, a tragedy will occur. Attempts have been made to raise the resistance of the patient towards the end of pregnancy, by vaccines, but the results have been disappointing, and there is no short cut to success in the prophylaxis of puerperal sepsis. Nothing but the most rigid attention to the general principles outlined above can be looked upon as sufficient, in the present state of our knowledge.

TREATMENT.—

LOCAL.—It is unfortunately impossible to apply the general principles of treatment of infected wounds, to the infected uterus. Removal of the whole of the infected area (*i.e.* hysterectomy) has been done, but it is not until the patient is too ill to withstand such an operation, or until the infection has spread beyond the uterus, that the indication for this drastic procedure arises. It is therefore of no practical value in these cases. Attempts to remove the infected lining of the uterus with a curette are now almost universally condemned, since in the first place the object is unattainable, and secondly such an operation frequently causes a general dissemination of

what was previously a local infection. Similarly attempts to disinfect the interior of the uterus with strong antiseptics do far more harm than good in these cases, since at best they merely leave necrotic tissue inside the uterus, without having any appreciable effect on the bacteria which are lying just below the surface. Simple intra-uterine douches, unless given with the greatest aseptic precautions (usually necessitating an anæsthetic), are more liable to carry infection into the uterus, than to wash bacteria out; this danger is however probably not so great after the first week of the puerperium. The only occasion upon which it is justifiable to explore the interior of the uterus, is when there is good reason to believe that a fragment of placenta has been left behind. In this case, the retained products should be removed with a finger or blunt instrument, and on no account should a curettage be performed.

With this exception therefore, the local treatment in acute puerperal sepsis must be confined to methods of aiding drainage of the lochia. The patient should be made to sit up in bed so that the lochia may drain more freely from the vagina; and oxytocics (such as ergot, quinine, and pituitary extract) may be given, in the hope that the uterine contractions will drive the infected secretion from the uterine cavity. During the last few years the injection of small amounts of glycerine into the uterus by means of a soft rubber catheter passed through the cervix, has been very widely used. The method has certainly much to recommend it, since it does promote a flow of secretion into the uterine cavity, and thus assist drainage; but although the technique is simple, yet for a patient who is really ill, it causes an amount of disturbance and discomfort, which is not always compensated for by a corresponding amount of real benefit.

SPECIFIC TREATMENT.—Vaccines have now had sufficient trial to shew that, in the vast majority of cases, they are useless, and occasionally actually dangerous, although it is still possible that some useful method of treatment may be evolved along these lines. Anti-toxic and anti-bacterial sera are occasionally successful in isolated cases, but the inconstancy of the results makes it probable that any improvement following their use is accidental. Anti-streptococcal serum in conjunction with quinine injections, is a form of treatment which has given satisfactory results in some cases. Blood transfusions at first seemed to be of value—at any rate the procedure seemed rational, since the patients are usually anæmic (from hæmolysis), and it would seem quite probable that the blood introduced might contain some useful anti-bodies. The results are however not only disappointing, but occasionally alarming; since the patients with puerperal sepsis seem specially liable to severe ‘reactions’

after blood transfusion. Remarkable recoveries do certainly occur sometimes after the use of blood, but at the same time the dangers are very real. On the whole there is a tendency to give blood transfusions for sepsis, much less frequently, and with greater apprehension, than was the case a few years ago. Immuno-transfusion has shewn no superiority over simple blood transfusion in these cases.

Attempts to attack the bacteria in the blood by chemical means, have led to the introduction of so many drugs for this purpose, that it would be almost impossible to enumerate them; and it will be sufficient to mention two of the most widely used. Novarsenobillon, although so successful in the treatment of Syphilis, appears to have little effect on streptococci in the blood; and although some are enthusiastic in its praises, its use has, on the whole, been disappointing. Mercurochrome given intravenously has lately become a popular method of treatment in septicæmia, but here again it is extremely doubtful if the results can justify its use.

GENERAL TREATMENT.—When we review the local and specific measures at our disposal, there is a tendency to despair of any treatment being of any value at all in puerperal sepsis, but we must not forget the value of general hygienic measures in these cases. Good nursing may just turn the balance in favour of recovery in a border line case, and it is certainly one of the most important factors in treatment. By attention to diet, sleep, and bowels, the obstetrician can add considerably to the patient's comfort; and since the specific 'remedies' are so uncertain in their action, it is more than ever necessary to look after the general hygiene. Patients with puerperal sepsis seldom have much pain, but as a rule they sleep badly, and hypnotics such as chloral, or one of the barbitone group, should be given when necessary. Constipation is often troublesome, but in its treatment care must be taken not to produce a profuse diarrhoea, which, once started, is very weakening and often difficult to control. Small doses of mild purgatives should therefore be given at frequent intervals, so that the dose may be graduated accurately for each individual; and it must be discontinued at the first sign of diarrhoea. The diet should be mainly carbohydrate, and as palatable as possible, and fluids should be administered in large quantities. The specific remedies mentioned in the preceding paragraphs, must be used as adjuvants to general treatment, and it must never be forgotten that the harm done by some elaborate technique which involves much disturbance of an ill patient, may outweigh any possible good due to the treatment.

The prognosis of puerperal sepsis is difficult to determine, but it was very fully discussed by the congress of British

* It should be the object of all our efforts in child welfare work to keep the child normal, rather than to treat it, once we have allowed it to become abnormal. The most important outside factor in the life of the new-born child is the mother, and it is therefore with her education, that we are chiefly concerned. There is no doubt that breast feeding should be insisted upon wherever possible (and the cases where it is not possible are very few), but it is just in this direction that so much ignorance is often displayed by the mother. Lately however popular literature has been widely published, and very widely read by the more educated classes, but there are still large numbers of women who require careful, sympathetic help, in the difficulties which they encounter in nursing.

In cases where the infant is not gaining weight, the cause will usually be found to be some error in feeding, and by simple instructions to the mother, the difficulty can often be easily overcome. In the rare cases where artificial feeding is necessary the physician can see that a suitable substitute for breast milk is given, in suitable quantities; and by his reassurances, may save an over-anxious mother from jeopardizing her child, by frequent changes from one food to another.

Advice as to the other functions of the infant, *e.g.* sleep, bowels, etc. will often save an ignorant mother from doing harm, by over anxiety, and over treatment.

Minor intercurrent diseases (usually infections of the respiratory or intestinal tracts), can be recognized early and treatment instituted, before the infant is so weakened as to be seriously ill.

So much has been written during the last few years on the subject of infant care, that it is difficult to select examples for reference, but recently a volume has been contributed to a rapidly increasing amount of literature, which is a very complete review of the subject up to the present time.

See also Obstetrical Nursing.

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OBSTETRICS IN THE TROPICS¹

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OBSTETRIC SHOCK

You will not be long in general practice before you will see a case of this condition—a condition which will cause you great anxiety. You may meet with two different types. The first is the early or primary type which follows immediately after the birth of the baby, and is due to reflex dilatation of the capillaries of the skeletal muscles with the result that the blood is dammed up and lost to the general circulation, the patient lying apathetic, grey and cold with an almost imperceptible pulse due to the fall in blood pressure. The other type is spoken of as delayed or secondary shock, and experience in this hospital leads me to think that this type is by far the most common, for, as you know, often-times patients are brought here after hours in labour at their houses. In this class of case the shock is caused by some poisonous substance, probably histamine, which is absorbed from damaged tissues and causes widespread relaxation of the skeletal capillaries and constriction of the pulmonary arteries and hepatic veins.

Miles Phillips states that this 'toxic substance increases the permeability of the capillary walls and so produces a reduction of blood volume by the escape of plasma into the tissues, thus diminishing the amount of blood plasma circulating to the upper parts of the body and, particularly, the brain, which is the essential feature in the modern conception of shock.'

That absorption of toxic substances from damaged tissue is the cause of secondary shock, there can be little doubt, and those of you who have seen war wounds or communal riot injuries will bear this out, for you must have attended many patients suffering from ugly, but not lethal, wounds who have succumbed within a few hours to secondary shock.

Similarly, if the pelvic floor, vagina and perineum are severely lacerated in a difficult obstetric operation after prolonged labour it is no uncommon occurrence for the patient, within a few hours, to develop all the signs and symptoms of profound collapse.

¹ Post-Graduate Lecture Notes.

• This being so, it is all-important from the point of view of prevention that you should bear in mind such predisposing causes as:—

- (1) Hæmorrhage.
- (2) Prolonged muscular exertion.
- (3) Prolonged chloroform anæsthesia.
- (4) Prolonged deprivation of fluids and carbohydrates.
- (5) Sepsis.
- (6) The fact that in the tropics mild or severe toxæmia of pregnancy associated with avitaminosis is very common.
- (7) Exposure and fright.

I cannot at this juncture go again into the whole detail of antenatal care for it would take too much time, but I do want you to realize that I am considering an emergency condition in a patient whom you may never have seen previously. Therefore should you be called to do an obstetric operation on a patient late in labour, remember that although your operation may be eminently successful, if you do not bear in mind some of these predisposing causes your patient may, within an hour, sink into a condition of profound shock and die.

Consequently if the systolic blood pressure is below 100 mm. unless active hæmorrhage is occurring delay all manipulation, keep your patient warm, and give her hot drinks—particularly hot water or hot milk to which you have added much cane sugar (*tal misri*) or honey, and give her a pint of 20 per cent. glucose into a vein, or one pint of saline into each axilla subcutaneously.

It is equally important to realize the mental and muscular exhaustion of your patient, for I am convinced that this factor is responsible for much maternal mortality, therefore I advise you to follow the long practice of this hospital and inject scopolamine without morphia. We give scopolamine 1/100th of a grain every half hour for two or three doses while things are being got ready. This drug has no deleterious effect and Professor Phillips has observed 'that the fall in blood pressure after a difficult labour is less after its use'.

Unfortunately we are unable to use gas and ether anæsthesia, but in such a case as I have been describing a combination of Pernoctan and ether has proved useful.

Hæmorrhage in every case should be prevented, whether it be by pituitrin, manual removal of the placenta, compression of the uterus and aorta, or hot douche, but let me remind

you of what I said last year, namely, that if the placenta is retained, the uterus is hard, and there is no bleeding, do not in any case of obstetric shock attempt to remove the placenta until such time as the patient has recovered, waiting even 24 hours in a desperate case.

Moreover, should there be severe tearing of the perineum and muscles of the pelvic floor, do not under any circumstances attempt such suturing as can very easily and with benefit be left until the following day.

Finally remember that when the immediate dangers have been recovered from, infection may cause great anxiety. Experience during the last three years has convinced me of the importance of Hobb's glycerine treatment and large doses of vitamine A in the form of Radiostoleum, in addition to such routine treatment as fresh air, sunlight, diet, and postural treatment.

Phillips and W. Williams both emphasize the importance of emotion as a predisposing factor in shock.

This aspect of confinements must be borne in mind, for the fright of obstetric operations or the neonatal death of a long-wanted baby may cause a patient in the East to turn her face to the wall and die.

For this reason the amnesia of scopolamine before labour, or morphia after, is very precious.

INDUCTION OF LABOUR

At the Obstetric Conference in April 1931 some very interesting papers were read on the induction of labour, and convincing statistics were produced by several authorities of a new method of procedure which consists in rupturing the bag of membranes.

It was shown that there was no case in which labour failed to follow this method and that it was applicable to all cases considered eligible for induction in the last 6 or 8 weeks of pregnancy.

There was no case of failure reported and no sepsis or infantile distress. The minimum time for the completion of labour was 4 hours, the maximum was 72 hours—primigravidae responding more quickly than multiparae.

In the Eden Hospital there are always many cases every year demanding induction, so I determined to try out this new method in preference to our usual routine of stomach tube and pituitrin.

The method I have employed is as follows:—

First administer a hypodermic of hyoscine, morphine and atropine, and then with the patient in the lithotomy position, cleanse the vagina and cervix thoroughly with ether soap and brilliant green (1:100 solution). Insert a posterior speculum and grasp the anterior lip of the cervix with a sponge-holding forceps. Then pass an unsheathed Bozeman's catheter or sharpened prostatic catheter through the cervix between the membranes and the uterus, round the presenting part until it is opposite the water-filled space near the neck. Depress the handle of the Bozeman with a slight jerk and it will puncture the membranes. Liquor amnii up to, say, 20 oz. is then drawn off and the patient is sent back to bed.

Another method I have used is first to scratch the membrane in front of the head with the stylette of a catheter and then alternately push up the head of the foetus and let go. By so doing one can milk out 10 to 15 ounces of liquor amnii.

The advantages of this treatment are

(a) That no anæsthetic is necessary and in multiparæ no morphine is necessary.

(b) There is no danger of sepsis as the catheter is removed when sufficient liquor amnii has been withdrawn.

(c) After withdrawal of the liquor amnii, the head of the child descends into the pelvis on to the cervix, stimulating dilatation and reflex contraction of the uterus.

This method is particularly applicable for patients with slight disproportion, and all cases of albuminuria which have not responded to treatment. I have used it so far in 18 cases.

There was only one avoidable catastrophe and that was a case in which by mistake (following the technique of stomach tube insertion) 3 minims of pituitrin were given half hourly to start labour pains. In this case unfortunately the child was born in asphyxia due to intracranial trauma.

ALKALIES IN THE RENAL COMPLICATIONS OF PREGNANCY

Recently I have seen several cases of sudden transient œdema in pregnant patients from the 5th month onwards in whom the urine was practically normal except for a marked decrease in the chlorides.

In one of these, the wife of a distinguished physician, the œdema occurred to an alarming degree, the legs and hands

becoming enormously swollen and the face so puffy as to obscure vision.

In another the lips, abdominal wall and feet would suddenly become oedematous; in neither was there any alteration or indiscretion in diet, but in both there was headache and heaviness. In both, during the attack, the chlorides fell to 0·1 per cent.

Recent research work at Queen Mary's Hospital, London, has shown that in cases of normal pregnancy there is a considerable decrease in the plasma bicarbonate, and that this decrease remains constant throughout the period of gestation.

Normally the water content of the blood is increased in pregnancy, and the lower the plasma bicarbonate becomes, the greater the oedema.

I am unable to explain the biochemistry of the reaction, but in these two cases, and several others, the administration of $\frac{1}{4}$ to $\frac{1}{2}$ ounce each of bicarbonate of soda and potassium citrate per day in water for a few days caused total disappearance of the oedema without any change in diet; at the same time the chlorides rapidly rose to 0·5 or 0·6 per cent. in the urine.

This therapeutic test will be of use to you, for cases of oedema, pre-eclamptic or otherwise, are very common in the East and you will find that alkaline treatment promotes diuresis and diminishes the oedema, without the discomfort of sweating, purgation and extreme limitation of diet.

It should be observed also that Clifford White some years ago demonstrated the fact that the administration of large doses of alkalis was of real value in the prognosis and treatment of pregnancy albuminuria and toxæmia.

PREGNANCY ANÆMIA

During the last two years much attention has been paid to the subject of pernicious or tropical anæmia of pregnancy—that type of anæmia in which the blood picture shows enlargement of the red cells and the presence of megaloblasts.

This disease, although often complicated by malaria, hookworm disease, or sprue is a distinct entity characterized by its blood picture and the fact that, unlike secondary anæmia, it is not benefited by iron and arsenic.

Lucy Wills, under the aegis of the Indian Research Fund Association, by numerous experiments on animals and human beings, has demonstrated the fact that this anæmia is not only a vitamine A, but a vitamine B deficiency disease and that

Marmite (vitamine B) is as active as liver extract in causing regeneration of the blood cells.

This disease is always with us in Bengal, and I am very pleased to tell you that carrying out her recommendations we have had excellent results with Marmite given in 2 teaspoonful doses twice a day either in cold water or in soup.

Marmite is very cheap and is uniformly more popular with patients than is liver, being of vegetable origin.

In a consecutive series of 50 cases I have no hesitation in stating that the clinical and pathological state of the patient greatly benefited as a result of Marmite treatment.

Again let me impress on you—prevention is better than cure—and that seeing how fatal this disease is (roughly 60 per cent. die) it is imperative for both doctors and public to recognize and treat these cases early.

The distinctive features of the blood picture with progressive anæmia are characteristic, but still I find patients arrive in hospital who have been treated for months as secondary anæmia, or in whom the œdema has been considered to be of renal origin.

The value of direct blood transfusion should never be neglected in these cases when a donor is available.

For instance, Mrs. M. (Hindu) 6-para, Wassermann reaction negative, was admitted in February 1931 in a desperate condition, with hæmoglobin 20 per cent., red cells $1\frac{1}{4}$ million. Sixteen ounces of blood were transfused. Her general condition greatly improved and she was confined at the 37th week and is alive and well to-day.

Mrs. H. (Muslim), Wassermann reaction negative, 9 children all dead, and all born prematurely because of pregnancy anæmia, was admitted at the 7th month in August 1931. Hæmoglobin 25 per cent., red cells $1\frac{1}{2}$ million, œdematous. Seventeen ounces of blood from her husband were transfused. She went to the 38th week and was confined in hospital naturally. Mother and infant left the hospital in good condition.

If direct blood transfusion cannot be arranged for, it is possible to improve your results by diet, sunlight, Marmite and intravenous injections of liver extract (Hepatox P. A. F., Lescher and Evans).

Iron and arsenic do not seem to benefit these patients at all—possibly because there is no achlorhydria in true pregnancy anæmia. But I do think that fresh ferrous carbonate in 10-grain doses three times a day is useful in the early stages of the

disease, or in cases intolerant of liver, for clinical observation makes me think that the border-line between chronic simple anaemia and pernicious anaemia of pregnancy is not great. If this is so, it would account for the extreme frequency of this disease in Bengal, Bombay and Madras—all malarious, crowded and devitalizing areas.

OBSTETRIC PROGNOSIS

The more one sees of obstetrics the more difficult it is to be absolutely didactic, for frequently patients with everything normal have difficult labours and those with circumstances against them have easy ones.

For this reason I am inclined to think that unnecessary emphasis is put upon pelvic measurements. Twenty years at this hospital have convinced me that there are only two measurements of real value; one the external conjugate, the other, the transverse diameter of the outlet immediately in front of the anus.

What you have to concentrate upon is:—

- (1) The relation of the foetal head to the pelvis;
- (2) Whether it is flexed or extended;
- (3) Whether it can descend below the horizon of the brim without overlapping;
- (4) Whether the lie of the child is anterior or posterior.

The pelvic grip, Pawlik's grip, and placing the flat of 3 fingers upon the symphysis will give you this information.

If a vaginal examination is permitted (1) you can try to feel the promontory of the sacrum, (2) you can estimate the size of the sub-pubic angle, and (3) endeavour to compute the degree of possible descent of the head into the pelvis by the Munro-Kerr or FitzGibbons' manoeuvre.

In the tropics, where maturity and marriages are early, small round pelvis and posterior positions are the two most common sources of difficulty.

Therefore you must always be on the *qui vive* as to the degree of disproportion which may necessitate intervention; for experience has taught me that 80 per cent. of tropical obstetric calamities such as eclampsia, septicaemia, complete rupture of the perineum, vesico-vaginal fistula and dead babies are subsequent to long labours in women with posterior positions or small round pelves.

This being so, whether in hospital or in private practice, we are confronted with the problem of

- (1) induction of premature labour,
- (2) test labour, or
- (3) Cæsarean section in any case where clinical examination suggests disproportion.

Provided the patient has arrived at the 38th week and disproportion is of the slightest, and especially if she is a primipara, I think induction has many claims for it, that is provided the course of labour can be carefully watched, for in that case the labour is to all intents and purposes a test labour, during which surgical intervention is possible, should such circumstances as foetal distress and delayed progress demand it.

Remember that rules and principles in the West are not invariably applicable in the tropics, for due to diet deficiency (particularly vitamine A) and a universal 20 per cent. hæmoglobin deficiency in all our women in the tropics, there is diminished resistance to infection and obstetric shock.

Moreover, uterine inertia is far more common in the East, due to flabby abdominal muscles, and this may jeopardize a seemingly normal case.

For these reasons test labour at full term, or even induction at the 38th week, is fraught with dangers which are hardly considered in the West—dangers resulting frequently in the doctor having the melancholy duty of informing the parents that the baby is dead and the mother very ill.

Every case is a law unto itself; but you must realize what disproportion means and be prepared to face the difficulties, and understand that it is a dreadful thing to perforate the head of a living foetus, when a Cæsarean section would conserve both mother and baby.

In order to confirm these convictions I have reviewed the last hundred Cæsarean sections performed by myself in hospital and in private practice. I find that 65 per cent. were operated upon because the head was lying non-flexed, in a posterior position, and was slightly overlapping the brim; 51 per cent. of these women had been more than 24 hours in labour when Cæsarean section (lower uterine) was performed, and many were post-mature.

Remember, therefore, the old mnemonic:—flexion means descent, descent means rotation, rotation means easy labour; non-flexion means non-descent, non-descent means non-rotation, non-rotation means difficult labour. Only constant palpation

of the full-term pregnant uterus in a hospital can give the post-graduate any sense of security as regards prognosis and the best treatment.

To sum up, in the West for slight disproportion, induction or trial labour, followed or not by Cæsarean section has the blessing of authority; whereas in the tropics induction and test labour have certain known dangers, which Cæsarean section does not possess in capable hands.

It is hoped that the tendency in the tropics among general practitioners to destroy a living child, when a Cæsarean section would save it, will gradually disappear with the growth of obstetric knowledge, for as I demonstrated last year the maternal mortality of craniotomy in India from sepsis and obstetric shock is 80 per cent.—a mortality 20 per cent. greater than that of a lower uterine segment Cæsarean section in this hospital for all the calamitous conditions of pregnancy, brought here, put together.

This perhaps is the place to speak to you of another condition arising out of difficult labour, the condition we speak of as foetal shock, for it is a subject I am particularly anxious you should understand and appreciate.

In days gone by when a baby was born after a long labour with or without forceps, in a state of white asphyxia, it was the custom to wipe out the mouth and then start vigorous artificial respiration, with the result that the infant rarely survived, though should it perchance make a gasp of indignation that was taken as a signal for still more vehement efforts until it died, or shall we say until it was killed. Now we know that these infants are suffering from foetal shock, which is clinically exactly the same condition as I have described in the mother under the heading of obstetric shock.

What you have to do in these cases is to keep the baby warm or better still in a hot bath, after you have cleaned out the fauces. Do not do artificial respiration, but if you feel you must do something then inject adrenalin into the heart or pituitrin into a muscle and rub the gum with brandy. Recently, however, thanks to the research work of Dame Louise Mellroy, we have acquired a new method which in part explains an old one.

Professor Mellroy some years ago described this condition of foetal shock and was the first I think to advocate the means we now use, but last year she gave us all a great lead by inventing a means of stimulating the respiratory centre of the pallid foetus, by the use of a mask connected up with a cylinder containing 5 per cent. carbon dioxide and 95 per cent. oxygen.

This apparatus which is quite cheap and handy I am able to show you to-day and I am certain we shall be able to achieve her results, which are based on physiological principles.

I said just now that this new method explained the occasional success of an old one, which of course is that of the attendant blowing down into the lungs of the baby through its mouth, hoping as he thought to start the reflex of respiration, but now we know that any fortuitous result of his efforts was not due to any such reflex, but to the natural carbon dioxide content of his expired air stimulating the respiratory centre of the baby.

Please, however remember, I am not talking of the baby born with intracranial trauma. In these, delivered though they be, with pallid asphyxia, permanent recovery is rare. In a few hours they develop twitchings, rigidity, cyanosis and are unable to take the breast or swallow. In such a case it is not foetal shock, but actual hæmorrhage or damage to the brain that kills. Schulze's method of artificial respiration is a deadly method and has killed or maimed many an infant that otherwise would have survived.

Finally, I should like to say again that the science and art of modern obstetrics will not advance until such time as a proper system of post-graduate teaching is established throughout India, for it is now generally recognized throughout the Western world that the maintenance of health and happiness in the family with the prevention of foetal and maternal mortality is the duty and responsibility of every good government.

HOW TO PREDICT THE DATE OF LABOUR

I. OBSTETRICAL TABLE

January	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Nov.
October	...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	
February	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28				
November	...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5				Dec.
March	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan.
December	...	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	
April	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Feb.
January	...	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4		
May	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mar.
February	...	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	
June	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		April
March	...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6		
July	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	May
April	...	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	
August	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	June
May	...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	
September	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		July
June	...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7		
October	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug.
July	...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	
November	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		Sept.
August	...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6		
December	...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Oct.
September	...	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	

N.B.—As the normal term of pregnancy is approximately 280 days, this table has been devised to show at a glance the beginning and end of every 280-day period throughout the year. Find the date of the last day of the last menstruation on the upper line of the horizontal row, and the figure below with the indicated month will be the 280th day.

II. QUICKENING.—Most commonly occurs in the 18th week; add 22 weeks or 5 calendar months, to the date of quickening. For example, if quickening occurred on June 4th, labour may be expected about November 4th.

III. HEIGHT OF THE UTERUS:—

6th Lunar month, level of umbilicus.

7th Lunar month, level of three fingers' breadth above umbilicus.

8th Lunar month, half-way between umbilicus and ensiform cartilage.

9th Lunar month, up to, or almost up to, the ensiform cartilage.

10th Lunar month, half-way between ensiform cartilage and umbilicus.

If these three reckonings agree, it is well; but if they do not agree, rely principally on the reckoning from the height of the uterus.

FETAL HEART.—Never heard before the end of the 5th Lunar month. Rate 120 to 160 a minute, best heard at a point midway between the umbilicus and anterior superior spine, more frequently on the left side.

THE DIAGNOSIS OF PREGNANCY BY BIOLOGICAL METHODS

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THEORY

The ovary undergoes a cycle of rhythmical activity which is associated with changes in the endometrium and in the motility of the uterine musculature. During the first fortnight after the onset of the menstrual period the Graafian follicle enlarges and ripens until rupture occurs at the time of ovulation. The ovum is liberated, and the membrana granulosa becomes converted into luteal cells. If the ovum is not fertilized the corpus luteum reaches the height of its development during the next week and then degenerates, so that the onset of the next menstrual period coincides with the final disappearance of luteal activity. During the first, or follicular, phase of the ovarian cycle a hormone, oestrin, is secreted into the blood stream. During the second or luteal phase, oestrin continues to be secreted but is supplemented by the luteal hormone progesterin. While the follicle is ripening the mucosa of the endometrium proliferates and the glands become tubular. These changes are due solely to the action of oestrin. During the follicular phase the endometrial stroma becomes decidual in type and the glands become tortuous and secrete mucus. This is due to the combined action of oestrin and progesterin.

Should the ovum be fertilized the corpus luteum persists and enlarges, and the endometrium becomes converted into the decidua of pregnancy, which is specially adapted for the reception and nidation of the developing embryo.

These ovarian and uterine cycles are controlled both in the non-pregnant woman and in the early stages of pregnancy by a hormone secreted by the anterior lobe of the pituitary. After the very early stages of pregnancy it is probable that the secretion of this *gonadotropic hormone* is taken over by the placenta, where it is produced in relatively large quantities and whence it is poured into the blood stream. Finally it reaches the urine, where its concentration varies according to the stage of pregnancy. During the first three months enormous amounts are excreted in the urine, but after that time the concentration gradually diminishes. During the first week of the puerperium its presence in the urine ceases to be demonstrable.

It was discovered by Aschheim and Zondek, in 1927, that the gonadotropic hormone, or *prolan*, could be demonstrated

in urine of pregnancy by the injection of such urine into immature female mice, the ovaries of which animals it stimulated to precocious ovulation with the formation of corpora lutea.

THE ASCHHEIM-ZONDEK TEST

5 female mice, 3-5 weeks old and weighing 6-8 gm. are used as the test animals. The urine is injected subcutaneously in 6 divided doses, 2 on the first day, 3 on the second and 1 on the third. The total dosage is as follows:—

Animal I	...	...	$6 \times 0.2 = 1.2$ c.cm.
Animal II	...	...	$6 \times 0.25 = 1.5$ c.cm.
Animal III	...	...	$6 \times 0.3 = 1.8$ c.cm.
Animal IV	...	...	$6 \times 0.3 = 1.8$ c.cm.
Animal V	...	...	$6 \times 0.4 = 2.4$ c.cm.

The mice are killed 100 hours after the first injection, and the ovaries inspected by the naked eye, with a hand lens or, if needs be, microscopically.

If either or both of the following changes are found in at least one of the ten ovaries, the result is reported as positive:—

HVR. II (Hypophysen-Vorderlappenhormon-Reaktion II) = corpora hæmorrhagica.

HVR. III = corpora lutea atretica.

Corpora hæmorrhagica are produced by hyperæmia of the thecal vessels which rupture into the ripening follicle, the blood mixing with the liquor folliculi. They appear as purple spots protruding from the cortex of the ovary. Corpora lutea atretica are recognized macroscopically as small yellow points on the surface of the uterus. They consist of follicles in which the outer layers of the membrana granulosa have become converted into luteal cells, while the inner layers remain intact and surround the imprisoned ovum.

One other change may occur:

HVR I = ripening of the Graafian follicle.

Here follicles distended with liquor folliculi protrude from the surface of the ovary. This reaction is not indicative of pregnancy, and if it occurs the test is repeated and is reported positive only if HVR. II or III subsequently occur.

THE FRIEDMAN TEST

One adult female rabbit is used as the test animal. The abdomen is opened under ether anæsthesia, and the ovaries are

inspected, 10 c.cm. of filtered urine are then injected into the marginal vein of the ear. After a minimal interval of 36 hours a second laparotomy is performed. If corpora hæmorrhagica or fresh corpora lutea are present, the result is reported as positive. If the appearance of the ovaries remains unchanged, the rabbit is injected with 10 c.cm. of urine obtained from a woman known to be pregnant, and a third laparotomy is performed, again after a minimal interval of 36 hours. Corpora hæmorrhagica or fresh corpora lutea should now be present. If they are not, the rabbit has been proved to be unreactive to urine of pregnancy, and the test is repeated on a second rabbit. The rabbit is chosen as the experimental animal in this test because it ovulates only as the result of coitus or the injection of urine of pregnancy. The rabbit ovulates within 10 hours of coitus, and the preliminary laparotomy guards against the possibility of coitus having occurred within a few days of the rabbit being used as a test animal. Furthermore, rabbits are variable in their reaction to urine of pregnancy, and the third laparotomy will detect those animals which will produce neither corpora hæmorrhagica nor fresh corpora lutea when injected with pregnancy urine. In this way any source of error due to the test animal is eliminated.

TOXICITY OF THE URINE

* It was found that the mortality among mice in the Aschheim-Zondek reaction during the test period was rather high, mainly as the result of the toxicity of the urine. Treatment of the urine with ether or sulpho-salicylic acid reduces this mortality considerably. The mortality in rabbits with the Friedman reaction is about 15%, but the test may be repeated more rapidly and conveniently than the Aschheim-Zondek test, and consequently detoxification of the urine is not practised.

ACCURACY OF THE TESTS

Both tests show an error of about 2%, if performed by skilled workers who have had considerable experience and who adhere strictly to the technique of the test.

HYDATIDIFORM MOLE AND CHORION EPI- THELIOMA

In both these conditions there is an excessive proliferation of the chorionic villi, which are in all probability responsible for the secretion of the gonadotropic hormone. The concentration of this hormone in the urine is consequently very considerably increased. It is therefore possible to diagnose these

conditions by means of a quantitative pregnancy test. The urine is diluted 200 times, and if a positive reaction is obtained hydatidiform mole or chorion epithelioma is reported. In cases where a hydatidiform mole has been evacuated, pregnancy tests are performed monthly for 6 months to exclude the development of malignant chorion-epitheliomatous changes.

ECTOPIC GESTATION

About 50% of extra-uterine pregnancies which give rise to symptoms show positive pregnancy tests. In cases where there is an acute ruptured ectopic pregnancy with considerable bleeding which is regarded as a surgical emergency the test is usually positive, and the result may be accelerated in the case of the Aschheim-Zondek test by using more than 5 animals and killing some of them at 60-72 hours. If positive the result is immediately reported to the surgeon. If negative the rest of the animals are killed at 100 hours. In the case of the Friedman test two rabbits are used, one being operated on 16-24 hours after injection. If negative the second is operated on at the end of 86 hours. In cases where the embryo has died *in situ* and been extruded through the fimbria, forming a pelvic haematocoele, the test is usually negative.

THREATENED OR MISSED ABORTIONS, MACERATED FOETUS, ETC.

In these cases the test is not reliable. The interval between death of the foetus and the excretion of an amount of hormone not demonstrable by the pregnancy tests is very variable. A negative reaction associated with previous positive clinical signs of pregnancy denotes foetal death, but it is possible to obtain a positive reaction within a month of the death of the embryo.

CONDITIONS OTHER THAN PREGNANCY

Chorion-epithelioma has already been mentioned. Malignant chorion-epitheliomatous tumours of the testicle may occur and give a very strongly positive 'pregnancy' reaction. Urine obtained from women at the menopause, at which time the secretions of the ovary are failing and there is complementary over-production of gonadotropic hormone from the anterior lobe of the pituitary, may give rise to IIVR. 1 in the Aschheim-Zondek test, but has never been reported as giving a positive Friedman reaction. Very occasionally disorders of the pituitary have produced a positive pregnancy reaction. Carcinoma of the genital tract in females has occasionally produced a positive Aschheim-Zondek test.

SUMMARY

The two biological tests for pregnancy which have been described have a 98% accuracy. The test is very strongly positive in cases of hydatidiform mole and chorion epithelioma. In acute cases of ruptured ectopic gestation the test is usually positive. In more chronic cases associated with pelvic hæmatocele it is generally negative. Where the foetus has died in utero the test is unreliable. There are a few conditions not associated with pregnancy where the test is very occasionally positive.

THE NORMAL INFANT

(1) *Weight* at birth 6·8 to 7 lb. A healthy baby increases in weight by 6 to 7 oz. a week, for the first two or three months, with the exception of the first week, during which it loses weight. Bottle-fed children are uncertain, but breast-fed children illustrate this rule with great uniformity.

The following table shows the weight during each month of the first year:—

Weight at one month	...	...	7·4 lbs.
„ „ two months	..	...	8·4 „
„ „ three months	...	...	9·6 „
„ „ four months	...	...	10·8 „
„ „ five months	...	...	11·8 „
„ „ six months	...	...	12·4 „
„ „ seven months	...	...	13·4 „
„ „ eight months	...	...	14·4 „
„ „ nine months	...	...	15·8 „
„ „ ten months	...	...	16·8 „
„ „ eleven months	...	...	17·8 „
„ „ twelve months	...	...	18·8 „

(2) The *circumference of the head* is normally 13 inches at birth, 18 inches at one year. The height, 20½ to 24 inches.

(3) At six weeks a baby begins to *observe and hear*: if it turns at a sound, it is not deaf and will not be dumb.

(4) At 3 to 4 months it *holds up its head*.

(5) At 6 months it begins to cut its *temporary teeth*, which should all be present at the age of three years.

(6) At 8 months it should be trained to go *without napkins*.

(7) At 10 months it should be *weaned*: if stationary in weight, it should be weaned before this.

(8) At 9 to 10 months the child *sits up*.

(9) At 12 to 18 months it *walks*.

(10) At 18 to 24 months the *anterior fontanelle* should be closed.

(11) At 24 months the child should *talk well*.

(12) At six years the *permanent teeth* begin to come, and by the age of 12 all are present, except the wisdom teeth.

Note.—for Table of Dentition, see p. 704.

(13) *Motions*:—

Age	No. daily	Character
First 2 months	... 3 to 4	In colour and consistence resemble beaten-up eggs, sour but non-feculent.
2 to 8 months	... 2 to 3	Gradually changing.
3 to 24 months	... 2	Brown in colour, pasty in consistence, and slightly feculent.
After 2 years	... 1 to 2	Well formed and feculent.

TABLE OF DENTITION

TEMPORARY

- 8 months, lower central incisors.
- 9 months, upper central incisors.
- 10 months, lateral central incisors.
- 12 months, first molars.
- 18 months, canines.
- 24 months, second molars.

PERMANENT

- 6 years, first molars.
- 7 years, central incisors.
- 8 years, lateral incisors.
- 9 years, first bicuspid.
- 10 years, second bicuspid.
- 11 years, canines.
- 12 years, second molars.
- 17 to 21 or later.—Third molars, or wisdom teeth.

Note.—In Indians a few exceptions may be found on the precocious side, rarely at later dates.

GYNÆCOLOGY

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TROPICAL AFFECTIONS OF THE VULVA

Rid your head of the idea that most affections of the genitalia are of venereal origin; for in your practice you will frequently be consulted about many distressing conditions of the vulva which have no relationship to gonorrhœa or syphilis. For instance, the genitalia are frequently the site of drug rashes and I have seen eruptions there, following quinine, potassium-iodide, Veramon and phenolphthalein. Again simple eczema

is a very common condition in the tropics especially in obese subjects. Oftentimes the surfaces weep or you will see yellowish-brown greasy looking scales. You will of course think of diabetes but in my experience sugar in the urine is rarely found in these cases. Try therefore to eliminate any septic condition in the vagina or bowel, such as, hemorrhoids, dysentery, or mycotic and epizootic infections. And remember, that despite all treatment and diet these cases are often intractable and relapse after apparent cure.

Pruritus ani is similarly one of the most devastating conditions. These patients when seen have usually had every known treatment and are suffering from secondary dermatitis as a result of scratching. When all ordinary treatments have been tried including looking for a cause in the rectum, stools and vagina, I think the best results are obtained by the injection of Benacol (Allen and Hanbury) around the anus subcutaneously.

Remember that the perinium and vulva area are particularly sensitive to X-rays. Therefore such treatment should be in the hands of an expert, lest secondary dermatitis or carcinoma occur as a result of the rays. One of the most distressing of all conditions is the ano-vulval pruritus, seen between the ages of 40 and 50, associated with atrophy of the epidermis and subcutaneous tissues, for a cure does not exist.

Non-venereal ulceration of the genitalia is not uncommon. I have seen yaws, leprosy, noma and tuberculous ulcers all of which have been diagnosed as syphilitic, but the condition I want to emphasize most particularly as a source of error is granuloma inguinale which is very common in tropical countries. Its appearance is that of progressive ulceration of the labia and perineum. Its edges are slightly raised and the skin is oedematous around the exuberant fleshy granulation tissue. It is a terrible mistake to diagnose this condition as syphilitic in origin, for the treatment is exactly the same as that of kala-azar and is attended with equally good results.

Occasionally you will see a rodent ulcer or epithelioma which has been incorrectly diagnosed in the neighbourhood of the vestibule or labium. So beware.

In out-patient departments it is not an uncommon thing for patients with an elephantoid condition of one or both labia to present themselves.

Do not dismiss them all as syphilitic, for it may be caused by a streptococcal skin infection with a subsequent lymphatic block or be secondary to ulceration especially on one side of the vagina, *e.g.* tuberculous or malignant. In other cases it may be due to filariasis.

Finally, very occasionally you will see in young people such rare conditions as ulceration following diphtheria, typhoid, measles and kala-azar.

Herpes in the genital region though recorded must be very rare, I have only seen one case.

LEUCORRHOEA

The 'White flux' is a condition particularly common in the tropics and one of no ending embarrassment to general practitioners; for, in India, proper examination is rarely permitted. Leucorrhœa occurs almost as frequently in the virgin as in the married woman, therefore perhaps it will be wisest to deal with the former class first, for they are a frequent source of anxiety to parents and schoolmistresses. The first thing which you must rid your mind of, is venereal contamination, for except in cases of obvious vulvo-vaginitis, the class of case that I am referring to, is that in which there is no local external disease whatever,—merely a constant creamy white discharge which stains the underwear.

It used to be thought that the virgin vagina was guarded by the *Bacillus vaginæ* of Doderlein, but my pathologist, Dr. Gupta, finds in smears and cultures that this bacillus of Doderlein is frequently absent, its place being taken by streptococci or *B. coli*, fungi, protozoa, trichomonas or even the ova of worms in the majority of cases of vaginal leucorrhœa. In some instances where palliative treatment has not succeeded, I have dilated the cervix under chloroform and taken smears and cultures from the cervical canal, for the glands being infected, have kept up the discharge.

Occasionally masturbation, with secondary pelvic congestion and infection may be a cause. In others ill-health or prolonged menstruation would appear to be predisposing features, but I have never seen tuberculosis doing this in an unmarried girl. Treatment without the help of a bacteriologist is empirical. My own procedure is, first to procure a swab for smear and culture report from the upper, middle and lower portions of the vagina by means of a thin rubber-topped hollow glass cylinder passed through the hymen. Scores of times I have tried vaccine treatment, autogenous and otherwise, but I am afraid I can say no good word for it in these cases. Local treatment in the form of douches, with a soft catheter are sometimes beneficial using 1 per cent. lactic acid or 1 per cent. synol soap or 1 in 2,000 acriflavine, and following the prescription of Davis of Milwaukee, in cases of fungi and protozoa I have ordered 1 in 14 iugol solution as an instillation.

* In inveterate cases, at the time of taking a swab from the cervix under chloroform, I have dilated the cervix and used the cylindrical terminal of an electro-cautery. This is pushed as far as the internal os and the current turned on. The radiant heat apparently kills local organisms, but care should be taken to apply it for only a few moments lest cicatrization occurs.

I need not speak of hygienic measures, such as attention to diet, exercise, cleanliness and moral platitudes, but I should like you to bear in mind what I spoke to you of last year in this connection and, that is, whenever you have any direct evidence of infection and that infection is due to a lowered resistance, remember that you should give, on the lines of Professor Mellanby, one small teaspoonful doses of Radiostoloum twice a day for six weeks at least. Radiostoloum is vitamins A and D combined. For the last 18 months I have been using this anti-infective vitamin preparation and I am quite sure, it is of great assistance in these cases.

In married women the problem of treatment is by no means difficult for in most cases there is a history of labour or miscarriage with possible laceration or infection of the cervix and uterus. In other cases there may be old tubo-ovarian disease with localized peritonitis. Very occasionally constitutional disease or localized tuberculosis may give the clue.

In elderly patients, you may find a salmon red vagina which looks like the throat in granular pharyngitis. Some of these cases are due to ovarian dysfunction, others are infected from a senile uterus or are trophic. Small doses of Thyroid gland, gr. $\frac{1}{2}$, once a day and douches with Sugar of Milk 1-2 teaspoonfuls to the pint, are useful.

PROLAPSE

The five cases which I show you are examples of prolapse of varying degree. There is no gynaecological condition more common in India. For a young woman who wants more children the Fothergill operation is ideal. For the middle-aged, or one who desires no more children, the interposition operation with ligation of the tubes is best. In an old woman if the prolapse is complete and there exists no pelvic diaphragm. The best results will be obtained from the Mayo-Ward operation of vaginal hysterectomy.

What are the respective merits of these operations from the point of view of the tropics? The Fothergill operation takes time—usually at least an hour—and involves the risk of shock and considerable bleeding in patients already debilitated,

Moreover, occasionally a *B. coli* infection and sloughing of the sutures occur. Also I have seen out here patients who have been operated upon in England in whom the uterus has remained retroverted and a source of distress. In others, subsequent to the amputation of the cervix sterility has occurred, or in the event of conception dystocia has resulted, in a few necessitating Caesarean section. Moreover, it is not improbable that the procidentia will recur in the event of future natural delivery.

The interposition operation is quickly performed, there is no bleeding or shock and, from the point of view of prolapse, provided a posterior colpo-perineorrhaphy is done, it is a radical cure, though perhaps, like the Bassini operation for hernia, it is not absolutely anatomical. I have done a great number of these operations and have never regretted one, though should a tumour form in the uterus removal at a future date of this organ would involve difficulties. These patients can leave hospital in 10 to 12 days, and are grateful, for the operation is accompanied by little after-pain as compared with the Pothorgill.

The Mayo-Ward operation is usually indicated in old people, and can be performed in under a half hour, which reminds me of a very useful hint. When doing any vaginal operation where bleeding may be expected, if you inject 1 to 2 c.c. of pituitrin into the para-cervical tissue before making your incision, there will be almost complete anæmia and hæmostasis. The Mayo-Ward vaginal hysterectomy is followed by a posterior colpo-perineorrhaphy, but should the patient be debilitated, this part of the operation can be put off for a few weeks, and be done later under novocain.

Pessaries have no place in the treatment of prolapse, and the operations are easy for a hospital surgeon. Moreover, do not forget that prolapse is a hernia, and, like other herniæ, tends to become larger as the patient grows older and musculo-fascia gets thinner.

PROBLEMS ASSOCIATED WITH THE CERVIX UTERI

At the present moment there is only one known way to combat cancer mortality and that is by the recognition of the process in its earliest stages, or better to identify those lesions which are definitely known to be forerunners of malignancy.

The importance of this statement will be realized when the public and all practitioners remember that one out of every 27 women die of cancer of the uterus. Now, it is a well-known

fact that women who have never borne children or in whom there has never been any previous inflammatory process within the cervix, rarely develop cancer of that organ. What then is the precancerous stage in a woman who has borne children? Surely it is the presence of chronic inflammation, the result of chronic irritation. This irritation being most probably of a chemical nature, just as coal tar produces carcinoma of the scrotum and a precancerous condition of the epithelium can be produced in the skin of a rabbit by the application of coal tar.

It has been suggested that the constant bathing of the cells of the vaginal portions of the cervix which were intended to remain in an alkaline solution with a purulent acid secretion is an important factor in the causation of malignancy. Nevertheless it must be remembered that chronic inflammation and irritation is kept up by the presence of hosts of bacteria which harbour in the complicated glandular arrangement of the cervical mucous membrane, and that an erosion of the cervix is neither an ulceration nor granuloma, but rather an adenoma.

We do not yet know the exact cause for the proliferation of cells previously normal to form what we call microscopic cancer, but there seems little doubt that chemical and bacterial irritation and inflammation are the predisposing factors. Therefore it behoves us in every case of erosion plus laceration in a parous woman over the age of 30 to insist on adequate treatment, and by that I do not mean painting with picric acid or carbolic, or the use of ionization and such like tinkering gynaecology, which prostitute the good name of our art, but rather excision, amputation or electric cauterization of the entire diseased area.

Huggins, in 2,985 cases treated on these lines during the last ten years, has never seen one of these patients develop cancer of the cervix, and in an admirable thesis he deplores the carelessness of the gynaecologist in his responsibility to infections within the cervix, and states that it is our duty to teach both the profession and the public that every infected cervix should be adequately treated as it carries with it the possibility of malignancy. He prophesies that the time will soon arrive when women will consult the gynaecologist once in six months just as they do their dental surgeon.

Time and again the writer has insisted on the importance and necessity of an adequate pelvic examination with the use of a speculum in the case of all women consulting their doctor, either immediately or remotely after confinement, or abortion. The accompanying plates I trust will greatly facilitate diagnosis, prognosis, and treatment.

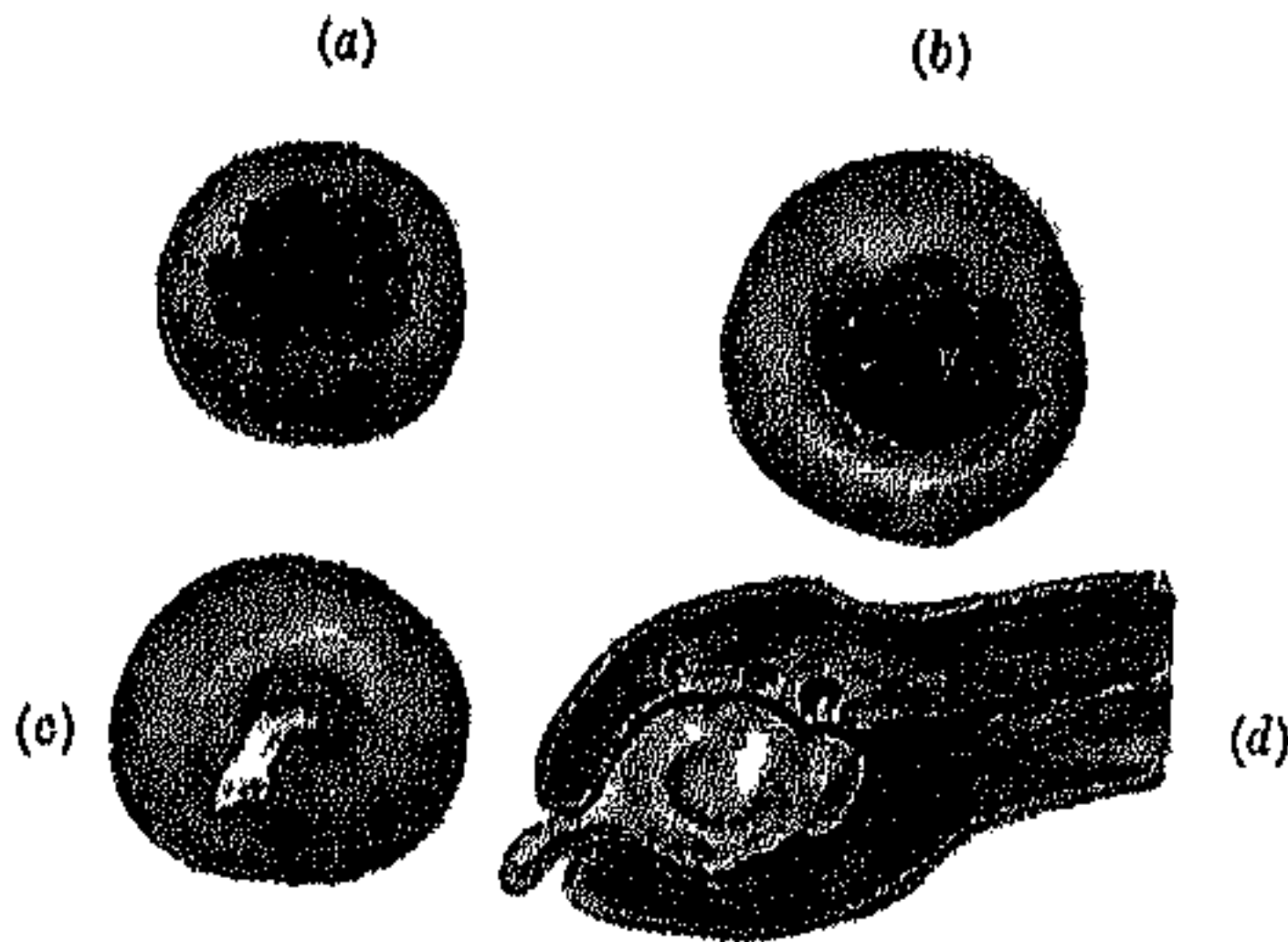


Fig. 1—(a) An erosion in a nullipara; (b) an erosion with eversion of the mucous membrane due to long standing endocervicitis in a nullipara; (c) cervix with a mucous plug in a case of sterility; (d) half section of such a cervix showing mucous plug as a result of hypersecretion of the endocervical glands blocking the passage to internal os. Many contraceptives in common use may cause this.

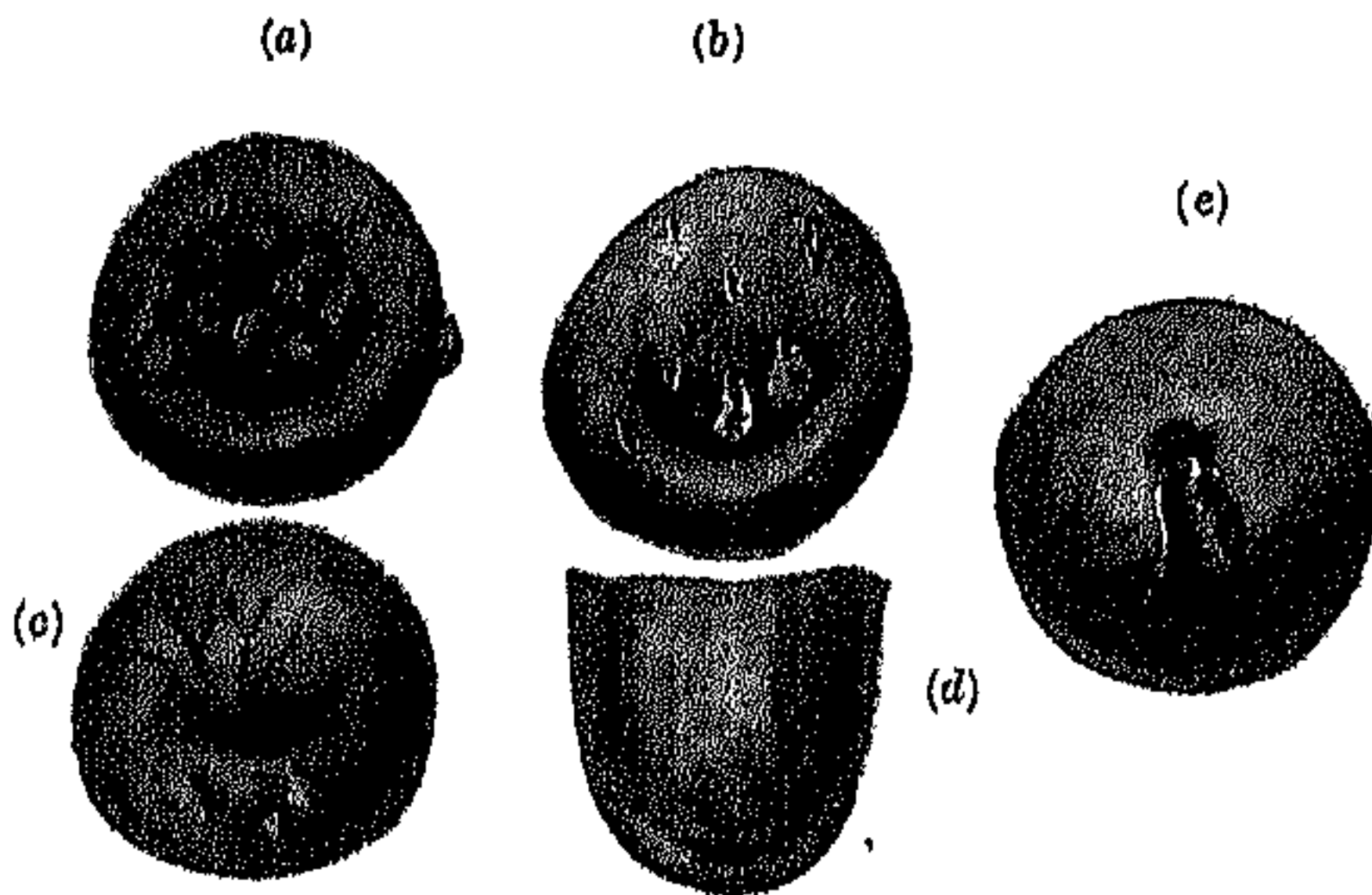


Fig. 2.—(a and b) The cervix of a parous woman showing eversion and many ovulae Nabothi, such patients frequently have pain in the back and profuse periods due to hyperplasia of the endometrium; (c) shows varicose vessels and a few ovulae Nabothi stabbed with cautery; (d) the typical conical cervix with so-called pin-hole os, associated so often with sterility, dysmenorrhoea, and the infantile or subpubescent uterus; (e) a cervix with a mucous polypus presenting at external os, causing continuous sanguous discharges.

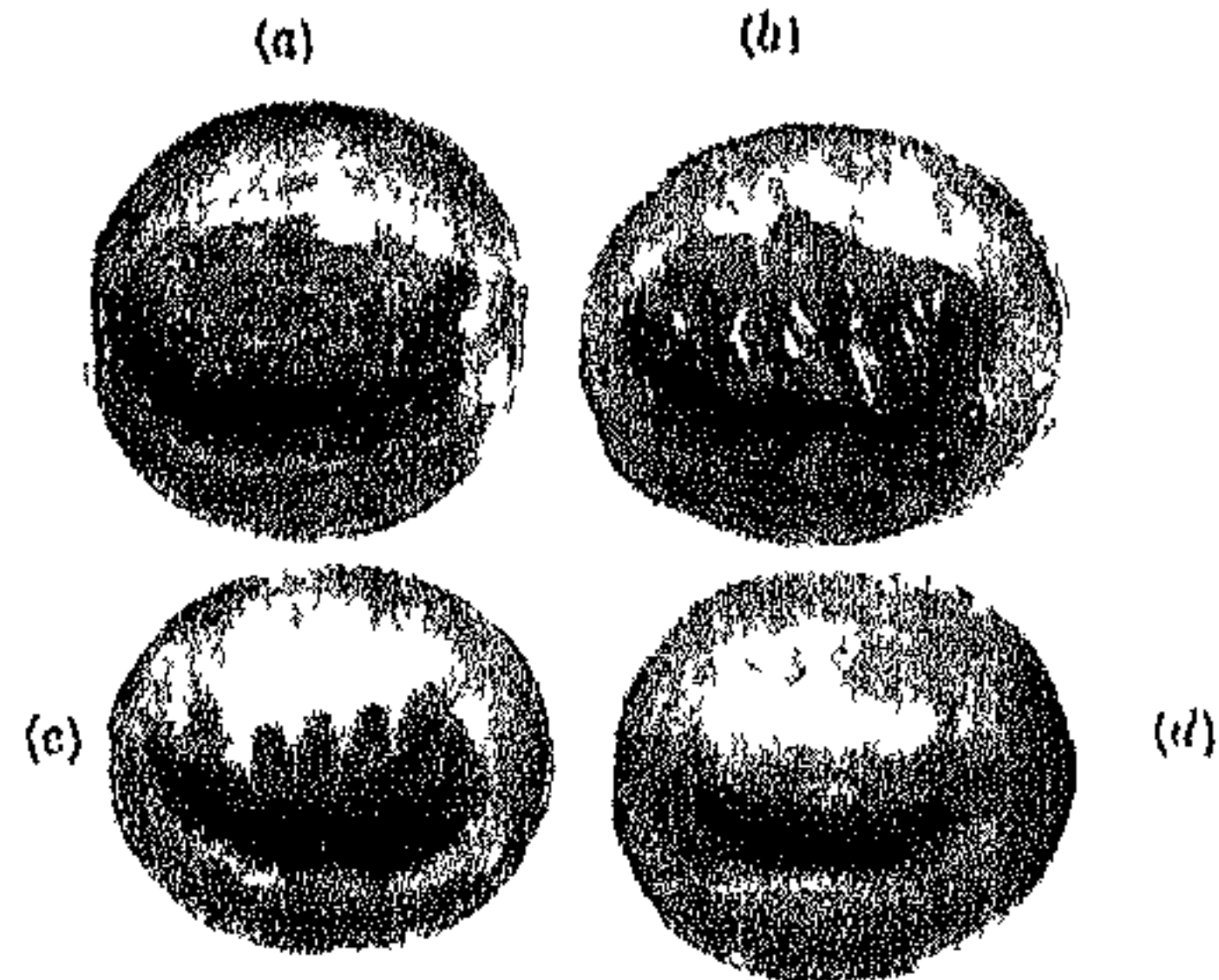


Fig. 3.—(a) The lacerated everted cervix of a multipara showing large readily bleeding papillary erosion, the outward and visible sign of an inward and invisible infective endocervicitis, the so-called precancerous cervix; (b) the same after the endometrium and endocervix have been excised and the cervix has been radially electro-cauterized; (c and d) the same seen 4 and 8 weeks after actual cautery.

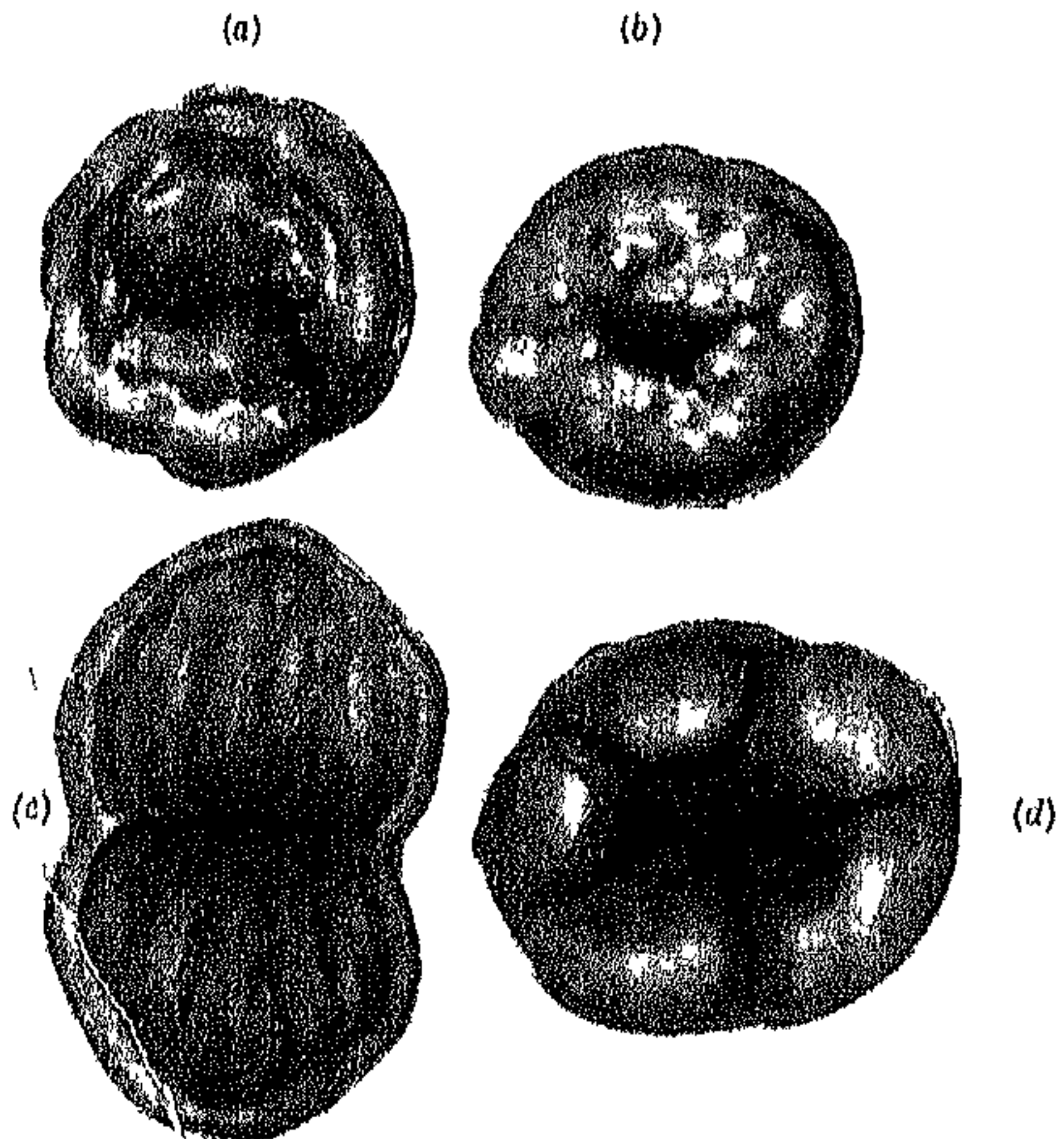


Fig. 4.—(a) Bilateral lacerated cervix with everted mucous membrane (Kelly), a fertile field for the development of cancer. Such a case is treated

best not by actual cautery but by early amputation (Bonney method) or by vaginal hysterectomy or radium. (b) Lacerated cervix with ovula Nabothi, (c), a duck bill lacerated everted cervix, often a precancerous condition, (d) a lacerated stellate cervix with eversion of mucous membrane, often precancerous.

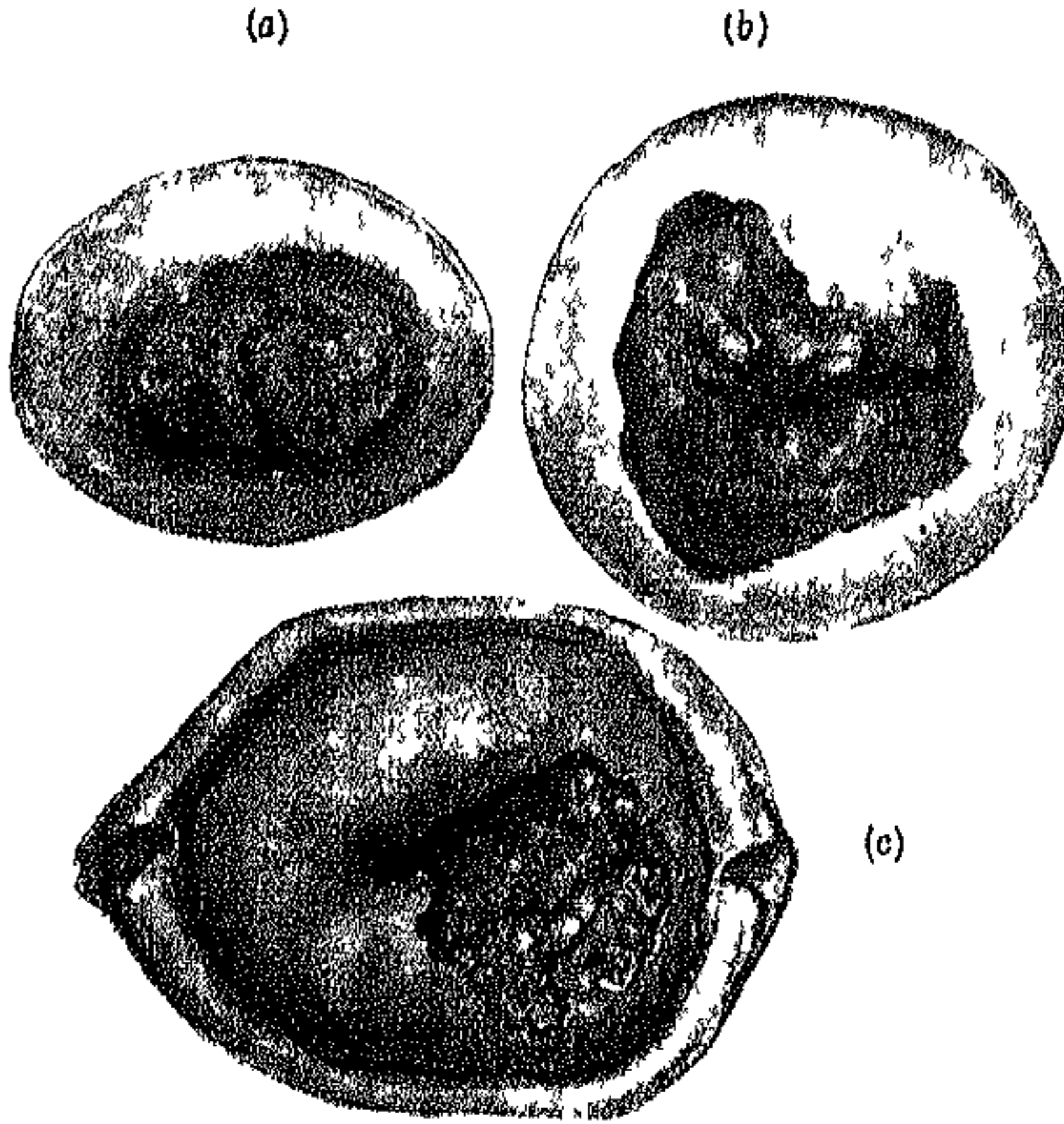


Fig. 5.--(a) An early case of squamous-celled cauliflower cancer of the cervix (Ruge); (b) the ulcerative type of cancer of the cervix (Ruge). Radium treatment by an expert is the best means we possess of giving a fair prognosis, with subsequent deep x-ray therapy. (c) An ulcerative type of cancer beginning at a scar at the left edge of the external os.

VESICO-VAGINAL FISTULA

Colonel Fraser has published in the Indian Medical Gazette recently an illuminating article which is of special interest to all practitioners in India, for the majority of fistulae seen are so large, so high up, so surrounded with dense scar tissue, or so un-get-at-able because of a contracted pelvic inlet and outlet, that any improvement in treatment must be welcomed.

His method is that of rectal transplantation of both ureters. He reports 24 cases, with success in 22 and no mortality, and gives in detail his technique. The operation is done in two stages, first one ureter is implanted, and then three or four weeks later the second ureter is dealt with.

The writer having performed this operation in a case of ectopia vesicae with success is greatly impressed with Fraser's

technique and results, and is determined to follow him at the first opportunity; moreover he is glad to see that the old bogey of post-operative pyelitis has also been laid by Colonel Fraser, for in his own case it did not occur, and 11 years later the patient conceived and went to term.

Cases of inoperable vesico-vaginal fistula are among the most tragic known to gynecologists, and I feel sure that every surgeon will welcome this contribution to our art, and particularly applaud the philosophy attending the last part of his paper, where he explains the necessity of two operations by telling his illiterate patients that 'the urine is escaping from two holes, hence he can only close one hole at a time'.

The operation I perform was reported in full with illustrations and the results of 14 cases in the *British Journal of Surgery*, 1932, and every gynecologist of repute should be able now to deal with these hitherto inoperable and pitiful cases.

PELVIC INFLAMMATION¹

I have chosen as my subject Pelvic Inflammatory Disease, as it is a condition which occurs in about 10 per cent. of all out-patient practice, and in about 5 per cent. of all gynecological cases in general practice. Perhaps more than any other woman's disease, this particularly requires the exercise of what I call the three I's: Industry—and by that I mean the industry implied in taking a correct history and making certain investigations; secondly, Imagination, because unless you can imagine what is going on pathologically inside such a woman's abdomen, you are never likely to be much good in the matter of treatment and prognosis. Thirdly, there is Intelligence, because without Intelligence you cannot possibly arrive at the correct diagnosis or method of treatment.

With regard to etiology, we accept to-day the fact that 70 per cent. of all cases of pelvic inflammatory disease are due to gonorrhoea, *i.e.* to gonococcal infections. 20 per cent. are probably streptococcal, or mixed infections of that, staphylococci and *B. Coli*, 10 per cent. are tubercular.

We will consider the preponderant cases, the gonorrhoeal, first. And I want first to say that the gonococcus in the female genito-urinary tract only follows the course of mucous membrane. That was discovered by Professor Schaefer, whose experiment some of you may remember. He injected into the cellular tissue of the pelvis of many animals a pure culture of gonococci, but in no case was there any pelvic inflammatory

¹ A Post-Graduate Lecture delivered at the West London Hospital, Hammersmith.

reaction. But if he put the gonococcus into the uterus of an animal, at once a reaction was set up which spread *via* the Müllerian tract. It was also proved, at the same time, that the gonococcus, like man, needs oxygen; in the absence of oxygen it readily dies. The interpretation of that fact you will see shortly.

It is important for you to realize that the gonococcus can remain localized. For instance, you all must have had, in your practice, cases only of Bartholin abscess, or urethritis, or cystitis, or vaginitis and cervicitis. On the other hand, the gonococcus may spread up through the cervix to the endometrium and the tubes, and remain there, the ovaries not being affected. In another type the gonococcus may pass, especially at the phase of ovulation in the menstrual cycle, through the uterus and tubes and infect the ovaries, and then you have that most difficult condition of abscess of ovaries—both, as a rule—and of the tubes. Finally, I want you to realize that the gonococcus has, like Rip van Winkle, the capacity of re-awakening at the least risk of re-infection. It used to be thought that when such a woman's resistance to disease became lowered, or she caught what is called a chill, the so-called gonorrhœal infection of the pelvis lit up again. That is no longer conceded; what is now believed is that the gonococci lie dormant in the cervix, uterus, tubes, and ovaries; and it needs but re-infection with a fresh strain from the husband to cause a new outburst.

Now for a matter of fundamental importance from the point of view of the general practitioner. A woman may have gonorrhœal pus tubes and pus ovaries, but have absolutely negative findings from a bacteriological point of view in the urethra, cervix and vagina. Hence the maxim: 'Negative bacteriological findings in vagina, cervix and urethra do not invalidate the presence of a pure culture, possibly, in the tubes.' The proof of that was recently shown interestingly in this hospital. It was in the case of a girl, of whom I took cultures from the urethra, cervix and vagina, and sent them to Dr. Elworthy; he found nothing infective or specific in any of them. The following week I did a hysterectomy on her, and sent down her enormous pus tubes to Dr. Elworthy; from them he was able to grow a pure culture of gonococci, showing that a negative finding in the vagina, cervix and urethra is not necessarily against there being active gonococci in the tubes.

In most cases of the kind you will find stigmata of old gonorrhœal infection. What are the stigmata in the vagina which you should look for? The first is what is known as the 'pouting urethra'; the meatal mucous membrane is red and everted. The second are what are known as Sânger's macules,

The curious red small areas on the nymphæ and vaginal orifice; when you see those in a woman who has pelvic inflammation you may be sure that the inflammation is of gonorrhœal origin. The next stigma is the 'Bull's eye cervix'. If you look at the eye of a recently-killed bullock you will see a pale area around the bulging congested red eye, and in the cervix a similar appearance is seen, with greenish-white pus exuding from it.

Now with regard to the question of diagnosis. In a case of doubt you will first, of course, take a swab of the cervical discharge, and one from the urethra by milking it, and, if you like, also from the vagina, but always from the cervix. In the cases of suspected gonorrhœal pus tubes you must put the speculum in and expose the cervix, and put your swab into the cervix. The second requirement is to make a bi-manual examination. If you find, high up in the pelvis, on each side of the uterus, an exquisitely tender banana-shaped or pear-shaped mass, discrete and apart from the body of the uterus, you may be fairly sure that they are pus tubes, and of gonorrhœal origin. But one feature which makes the diagnosis absolutely conclusive is, that in tubo-ovarian disease of gonorrhœal origin there is no parametritis, no inflammation of the cellular tissue (you will remember Schaefer's experiment).

At any time you may be called to a case in which an immediate diagnosis must be made between pelvic inflammation due to gonorrhœa, due to appendicitis, to torsion of a tumour, to ectopic gestation, or to the bursting of a 'chocolate cyst', that is a case of endometrioma. In previous lectures we have dealt with each of those four conditions. In dealing with appendicitis we said there were certain physical signs which are, as a rule, on the right side only. And we went into the matter of Baldwin's tests, the so-called Heald's hyperæsthesia tests, and Rovsing's test. There is also the test of peritonism and rectovaginal examination.

The first Baldwin test: press on the abdomen with one hand, then ask the patient to raise her right leg straightly. If on raising the leg she suddenly drops it, the test is positive, meaning that the inflammation round the appendix is involving the psoas muscle. In the next test the patient is lying in bed, and you rotate and abduct her right thigh; by which you must pull on the psoas muscle, and if the appendix is in the neighbourhood of that muscle she will call out as the thigh is rotated. The third Baldwin test is to lie the woman on her face and then you press the right loin, and as you do that from behind, raise the thigh off the bed, then she will at once cry out. Heald's hyperæsthesia tests we often do in the out-patient department. With a safety-pin we run down the front of the abdo-

men and ascertain which is the area of greatest hyperæsthesia; in most cases this is near McBurney's point, i.e. the viscerosensory nerve supply area. The next Head test is to pick up the skin and fascia of the abdominal wall in the appendix area with your fingers, thus stretching the nerve fibres which go through the fascia into the fat, and the patient at once winces. The next is to test for rigidity of the peritoneum.

Rovsing's test is a novel one. Press deeply on the left side of the hypogastrium, thus displacing any air which is in the descending colon upwards into the transverse colon and cæcum, and this may distend the inflamed cæcum, causing pain. The practitioner should not find it difficult to distinguish acute appendicitis from pus tubes. But in an ectopic there is no great leucocytosis, there is no history of gonorrhœa, there is no fever, there is usually a history of a delayed period or amenorrhœa. The pain is colicky, and is associated with much blanching and shock. Many mistakes have been made by surgeons diagnosing acute salpingitis as appendicitis, whereas if they had quietly waited, or sought the opinion of a gynecologist the condition would have been obvious vaginally. Torsion of a tumour is a clear-cut condition; you should be able to diagnose it because a tumour can be felt vaginally; there is no fever nor much leucocytosis; usually there is local resistance, and a mass can be felt on one or other side of the abdomen. Pus tubes is always a bilateral disease.

Endometrioma, or the bursting of a 'chocolate cyst' is a recent phase of gynecological pathology, and you would be forgiven if you failed to diagnose it. It is the bursting of a tumour which is made up of material which looks like menstrual fluid, and that fluid is very irritating to the peritoneum. You can only diagnose it in a woman in whom you know that coitus has not recently occurred and the patient has not had any previous gonorrhœal discharge, and where you know that she has not had children in the last five or seven years, and has suffered recently from dysmenorrhœa.

Prognosis is a very important matter. Try and remember that 90 per cent. of cases of acute pelvic inflammation subside if they are left entirely and absolutely alone; only 10 per cent. cause such symptoms as general peritonitis, with, of course, the symptoms of ileus duplex, or obstruction. When I say 90 per cent. subside if they are left alone, I mean that the acute symptoms—the fever and the pain—subside. In a large number the condition will clear up entirely, and the patient will have nothing to show in her pelvis in six months' time; indeed, a woman may have one attack of acute salpingitis of gonorrhœal origin, which may clear up and leave no sign whatever of disease. But it *will* leave sterility due to blocking of the tubes.

Here is a lipiodalogram of such a case taken shortly after matrimony, she is permanently sterile unless salpingostomy is successful, but the whole of her pelvic inflammation has disappeared. In a small percentage of cases the inflammation goes on for a considerable time, and the development of what we call hydrosalpinx occurs or chronic thickening and pain in the neighbourhood of both ovaries is felt.

There is another condition which may happen, and that is, the inflammation may subside, but the uterus is left in a posture of fixed retroversion, with prolapsed ovaries; such a patient may be constantly seeing her practitioner, or attending a hospital out-patient department, for menorrhagia, back-ache, dyspareunia, or dysmenorrhœa.

Some of you may want to know in what percentage of pus tubes, gonococci can be found. I can only report what I have found in my own experience. Up to the end of 1932 I had operated upon 612 patients on account of pus tubes, and found gonococci in only 12 per cent. of that number. So although the diagnosis is correct, gonococci may not be present in the pus, because Nature is able to auto-sterilize these patients. That is their immunity is raised sufficiently to enable them to kill the gonococci *in situ*. When gonococci are long inside a pus tube, no oxygen being available for them, they die, and cannot be found by the bacteriologist. And another strange thing may happen, namely, that this gonorrhœal pus may become invaded secondarily by *B. Coli*, the presence of such organisms being notified by a foul smell. Yet these abscesses are sterile and the organisms dead. You need not fear to close an abdomen when such is the case; you will get an excellent result.

Now as to the subject of prognosis, from the patient's point of view. In something like 15 per cent. of cases of acute pelvic inflammation, an abscess forms in the tube or in the pelvis, which may point either in front or behind the uterus, so we say that the examining finger is the best arbiter of prognosis in all cases of pelvic peritonitis. If you feel that a patient has got an abscess in front of the uterus and there is dysuria and swelling then, in a number of cases, anterior colpotomy is the best operation; but if there is an abscess in the pouch of Douglas behind the uterus with mucus from the rectum and a mass pointing in the vagina, posterior colpotomy is best. Many of you must have seen cases in which abscesses have burst into the rectum, or into the vagina, or into bladder; they were all cases which could have been anticipated if a diagnosis had been made in an early stage, and the abscess had been drained. Colpotomy is an easy operation, and I used to insist that every post-graduate should be able to do a colpotomy.

These cases are very frequent, and remain in hospital only a few days, though months later laparotomy may be advisable.

As to treatment, seeing that 90 per cent. of cases subside and become quiescent if you leave them alone, the treatment in early cases is entirely medical. By that I mean you must give these patients morphia for their pain; you must give them hot vaginal douching. But many patients will tell you they get more relief from a hot saline enema than from a hot saline douche. If you have got the apparatus, put an ordinary cage over the patient's abdomen and apply radiant heat by means of ordinary electric light bulbs. In private houses radiant heat is very valuable.

The next course is the same as in acute appendicitis; do not give castor oil. Do not purge these patients, because if you set up peristalsis in the neighbourhood of pus coming out of the fimbriated ends of the tubes, dissemination of the pus will occur, and generalized peritonitis may ensue. Lord Moynihan, in his address on acute appendicitis some months ago, said that the greatest mortality in connection with appendicitis was not due to the surgeon but was caused by castor oil. For patients with acute salpingitis, after the third or fourth day I give 10 cc. of aolan into the buttock every three days, hoping for a big reaction. You can get five of these ampoules for 3s. 6d. In the course of ten to fifteen days the temperature becomes normal, then your finger becomes the arbiter of treatment. Whether the patient is going to develop a constant pus tube, or whether the whole condition is going to subside, you will have to judge. As the life of the gonococcus is only six to twelve weeks, it is safe to operate on any woman with double pus tubes, three weeks after the temperature has subsided.

By that time probably the gonococcus will have died, so there will be nothing to fear, wherever the pus may escape. It must then be decided whether to operate abdominally or vaginally. I recently looked up my statistics. In 800 consecutive hospital cases, 612 were operated upon, and of these 480 were operated upon abdominally, 132 vaginally, that is to say, by anterior or posterior colpotomy.

Now a few words with regard to the operation. If on opening the abdomen you find that the condition is as you have diagnosed it, double pus tubes, you must remember the oldest maxim in gynaecological surgery: 'locate the top of the uterus, and the tubes and the ovaries shall be delivered unto you'. The first thing then the surgeon must do is to find the top of the uterus, after that the operation becomes easy. But if you scrabble about, like a fowl in a farmyard, you will not know where you are. The next point is, that in gonorrhoeal pus

tubes the adhesions are always very easily separated, which is the exact opposite of the streptococcal type. The experienced surgeon says, 'I know it is gonorrhœal, because I can separate the adhesions so easily', and therefore is not perturbed if pus leaks out, for he knows it will be sterile.

Try, in every case, to leave one ovary, or a portion of both ovaries, because you do not want the patient to be completely menopausal after the operation. Remove the pus tubes; in some cases it is necessary to remove the uterus also, as in a case the other day, the patient had an abscess at one cornu of the uterus, and therefore I did a hysterectomy as well as removed one ovary and both tubes.

Another point, which is frequently neglected, is, do not forget to ventro-suspend, or ventro-fix the uterus afterwards. Half the bad results of such operations are due to the fact that the surgeon forgets to ventro-fix or ventro-suspend the uterus afterwards. If he does not carry that out, the uterus drops back into a raw inflamed space, and the patient returns complaining of dyspareunia, etc. A further point is: do not forget, before terminating the operation, to bring down the omentum or, as it is called, the 'abdominal policeman'; it is the most important structure in the abdomen, from the woman's point of view. Bring it down and put it behind the uterus.

I shall now leave the subject of pelvic inflammation due to the gonococcus, to speak of pelvic inflammation due to the streptococcus. When a woman comes to you with pelvic inflammation, your first duty is to find out whether she has recently had an abortion, or an operation on her uterus, such as dilatation, curetting, or possibly a criminal abortion, or it may be she has had a child in the last three or four months.

Will you try to remember the experiment of another distinguished pathologist, that of Whitehouse, who injected into the uterus of animals a pure culture of streptococci, and staphylococci, and nothing happened. Why? Because they need cellular tissue for their growth, just as the gonococcus was shown to need mucous membrane. That experiment of Whitehouse is of tremendous importance, because now we know that when a woman develops, after childbirth, or after operation, or after abortion, a streptococcal infection, she must simultaneously have received, or had, an abrasion of some portion of her generative tract, because streptococci need a tear or a crack or abrasion of mucous membrane in order to reach cellular tissue, colonize, and multiply, so setting up an intense inflammation. I call the streptococcus in the female generative tract 'the Scotsman of the pelvis,' because it will not die; it is very courageous and resists every form of treatment. Indeed, streptococci in pure culture have been found in the pelvis so long as

10 years after infection; they can set up acute inflammation after years and years, so if a careful history has not been taken, a laparotomy may be done, the leaves of the broad ligament may be opened, liberating live streptococci with a fatal result.

When you have a case of streptococcal infection of the tubes, the infection occurs extra-peritoneally from the broad ligament, and it may pass thence into the ovary, and there set up miliary abscesses (*drawing*). That is the type of case commonly seen in hospitals; we have had three here in the last fortnight. Such women may have an enormous cellular mass outside the peritoneum, or between the bladder and the uterus, or it may track up above Poupart's ligament, or up as far as the kidney, or down into Scarpa's triangle. Inflammation of streptococcal nature follows the course of cellular tissue. It is the cause of 90 per cent. of cases of parametritis, and 25 per cent. of these become abscesses, which it will be necessary to operate upon, either vaginally or extra-peritoneally. But how is it that women die within five, six or ten days after labour due to streptococcal infections? Imagine a skull, showing the ethmoid sinuses and cribriform plate and the frontal sinus. In very virulent infections of the nasal tract organisms pass up into the dura, and the patient quickly develops cerebro-spinal meningitis and dies. A parallel happening occurs in the uterus; in a certain number of cases, the streptococci go straight through the tubes into the peritoneal cavity on each side, and set up a general peritonitis. The streptococci do not do harm to the tube itself, they shoot right through the tubes into the peritoneal cavity, setting up a fatal peritonitis. Fortunately such cases are rare. The most common cases we see in the out-patient department are those of parametritis of streptococcal origin. Puerperal streptococcal peritonitis is a cause of death in 25 per cent. of all cases of puerperal sepsis mortality.

How do you diagnose parametritis of streptococcal origin? First, the patient has a mass so hard that it feels like plaster-of-paris, low down in the vagina, or beside and around the cervix. That mass is fixed to the pelvic wall, and the uterus cannot be differentiated from it, the uterus and the mass being one. Though these masses are hard they are not very tender, whereas a pus tube is exquisitely painful. There is usually a good deal of anaemia, and always a rise in temperature, which goes on for weeks, perhaps months; I have known a patient have an elevated temperature for 18 months with a parametric exudate and accompanying great invalidism and anaemia. But very rarely are such patients permanently sterile. She may get a parametrial exudate because the cervix has been torn, but she is not necessarily sterile, as is the gonococcal patient, because in many cases the inflammation is extra-peritoneal and the fimbriated ends of the tube are not closed up.

• The treatment of these streptococcal cases is almost identical with that of the others, except that you must put a needle in if you suspect pus to be present, either above Poupart's ligament or above Petit's triangle, or vaginally. Diathermy is useful, though it is an expensive treatment. There is also radiant heat. The bowels should be kept regularly acting, after the fourth day. Non-specific protein therapy, such as 10 c.c. injections of aolan every fourth day has given me most satisfaction.

I have said that 10 per cent. of tubo-ovarian masses are tubercular. These cases are interesting in that the diagnosis can usually be made by the youth of the patient, by being able to feel the nodular tube, and by the fact that there is very often a primary focus in the lung, and of course there may be ascites. In some of these cases there is a good deal of inflammation, because the tubercle bacillus has a habit of joining hands with other organisms; in the pelvis there will often be tubercular tubes with staphylococci in the pus as well as tubercle bacilli.

X-rays are of great use in arriving at a diagnosis in a doubtful case. In a case of primary tubercular disease of the tubes I am sure surgical treatment is best, combined with proper hygienic treatment afterward.

' THE FROZEN PELVIS '

What the Americans call ' the frozen pelvis ' is common in out-patient departments and examination halls. Digitally the whole vaginal vault and the contents of the pelvis seem as if set in plaster-of-paris. These cases are, of course, inoperable, and are usually of streptococcal origin. It is impossible to separate the adnexa from bowel or bladder without tearing them. The only treatment is diathermy and skim-milk injections.

RUPTURED ECTOPIC PREGNANCY

As a surgeon on the staff of a cottage hospital your first case may be a ruptured ectopic pregnancy. If the patient is almost pulseless from shock and loss of blood, don't operate while she is in that state, for she will not leave the table alive. Give her morphia, transfuse her and keep her warm until she has rallied. Then get in and get out quickly.

In the next case you meet the diagnosis may not be so certain. If in doubt, put a record needle into the pouch of Douglas, you will be sure if free dark blood is drawn up. This simple procedure has saved scores of regrets and unnecessary

operations. Several times I have heard of an ectopic diagnosed and laparotomy done, only to find a burst follicular cyst, without any blood. Remember a hæmatoma ovarii may cause all the symptoms and signs of a ruptured ectopic.

Never do any extra-uterine gestation operation in a hurry, until you have asked one question after making the clinical examination, namely, 'Have you passed a cast?', or 'Does anybody know whether she has passed a cast of her uterus?' If she has, then you will know that the ovum is dead, that the abortion is complete and that the blood-vessels will have ceased to bleed. In such a case there is no need to rush operation that night; you can calmly make all preparations for operation on the following day in the best circumstances.

There are five principles which, as general practitioner surgeon to a cottage hospital, you should remember:

1. 'Get in and get out quickly.' It is obvious you must do so, because the patient has lost blood and you must not delay.

2. Examine both tubes. You might think that unnecessary, but on three occasions I have seen pregnancy in both tubes. If a tubal abortion is complete, you may find both tubes looking exactly alike, and both full of blood, and sometimes it is difficult to tell which tube has been the site of the pregnancy. Do not think that all cases of extra-uterine gestation are actual ruptures of the tube; about 60 per cent. of tubal pregnancies are tubal abortions through the fimbriated end, and so, are extruded into the peritoneal cavity.

3. If there is no donor present and you are in a cottage hospital where giving a blood transfusion is a difficulty, remember a very easy thing you can do—auto-blood transfusion. You squeeze through gauze into saline the blood which you scoop out of the abdomen and put it back into the woman's veins. That will save many a patient who is desperately ill.

4. Regrettable mistakes are made by the surgeon forgetting, in his hurry, to scoop all the blood out of the pelvis. As the old maxim says, 'Leave the pelvis dry'. The reasons are two: First, if you leave a lot of blood in the pouch of Douglas, the rectum is so close that that blood may become infected, and pelvic abscess follow, for which you must do posterior colpotomy. The second reason is that the uterus may drop back, and then the remaining tube is surrounded with blood, which becomes organized, forming veils of fibrous tissue round it and the ovary, with subsequent sterility. I have seen a dozen cases of women returning with the complaint of sterility and tubes negative to lipiodol and air because the surgeon

forgot to leave the pelvis dry and clean, with the result that the uterus dropped back into a pool of blood-clot.

5. In all cases of extra-uterine gestation pass a catgut stitch through the peritoneum of the uterus, above the utero-vesical fold, and ventro-suspend the uterus before closing the abdomen; that prevents it from dropping back with subsequent dyspareunia or sterility.

CHORION-EPITHELIOMA

Five per cent. of women suffer from chorion-epithelioma after hydatidiform mole, which, though not very common in England, is of frequent occurrence in the tropics. If you diagnose this condition, you can operate from below, doing vaginal hysterectomy, with ease. I have done 4 vaginal hysterectomies for chorion-epithelioma in 10 years. There is less hæmorrhage and no shock, and little fear of infecting the general peritoneal cavity by this route. Three patients were alive and well one year afterwards; one died of hæmoptysis six months later.

CERVICAL FIBROIDS AND BROAD LIGAMENT CYSTS

Although these tumours are not uncommon, they are always a source of anxiety during operation. Few surgeons of any large experience have not at one time or another cut or torn a displaced ureter or bladder. On one occasion on opening the abdomen I cut right into the bladder, and on another I cut away 8 ins. of a very displaced ureter which I had ligated with the infundibular ligament. But provided you realize what has happened nothing untoward will occur. The books say that the ureter can be anastomosed or that it can be implanted into the bladder, but those are very difficult and tedious procedures; personally I think the easiest and quickest method is to transplant the proximal end into the sigmoid colon on the principle of Coffey's operation, using the same technique as I have described for inoperable vesico-vaginal fistulæ and ectopia vesicæ. In the case recorded above this was done and recovery was uneventful. The bladder can always be sewn up with fine catgut, and invariably heals if a self-retaining catheter is inserted. In the case of large tumours, you must be prepared for and guard against shock and hæmorrhage, which are very common when large retroperitoneal areas are laid bare.

LARGE OVARIAN CYSTS

Large ovarian tumours are not so common in England as they were, but still from time to time they turn up, and are perhaps admitted into medical wards as ascites and tapped—a very regrettable error. We had one of these here the other

day in a girl of 17. Under no circumstance should tapping be done, for there is the risk that if the contents contain carcinomatous cells or infected material, you will infect or metastasize the peritoneum. In the East and America large ovarian cysts are still frequently seen. In 1931 I published my results in 547 cases and have since done a large number. My experience is that these tumours may, like an appendix, be a very easy operation or one of the most difficult in surgery. Remember that you should make a big incision, separate adhesions, and try to oventrate the tumour without tapping or bursting it, recalling the old maxim, 'Find the uterus, and the tubes and ovaries shall be delivered unto you'. Finally, having peritonealized the stump and all raw areas, do not forget what I said under ectopic gestation, namely, to put a few ventro-suspending sutures in before closing the incision lest the patient return with dyspareunia and menstrual troubles.

ENDOMETRIOMA

Endometriomata are commonly met with. German authorities say that they occur in 14 per cent. of all gynaecological patients; Americans put the figure at 8.6 per cent., whereas in India I worked it out at 10.6 per cent. From the standpoint of major surgery, an endometrioma causes doubt, either because it is a tumour or because it forms a tubo-ovarian mass, or because it forms an obstruction in the bowel, vagina or rectum. Not long ago, in cases of the latter nature the bowel was resected or the rectum removed for what was supposed to be cancer. There may be a tubo-ovarian mass simulating that of gonorrhœa, a tumour like a fibroid, or a mass obstructing bladder, rectum, vagina or large intestine. When operating you should be able to recognize endometriomata by cysts containing chocolate-like material in the ovary (they readily burst), or by the 'œil de perdrix' (partridge eye) encasements on the surface of the omentum, uterus, adnexa, bowel or bladder with dense adhesions. If you do you will not diagnose cancer and resect bowel, bladder or rectum.

In a severe case all you need do is to remove both ovaries and, if called for, the top of the uterus, for these endometriomata depend for their growth on hormones from the ovary, and with removal of these glands (in an early case we try to conserve a portion) the tumour obstructing the vagina, bladder or bowel, atrophies and disappears.

OVARIAN TUMOURS

Neoplasms of the ovary are extraordinarily common in all tropical countries, but probably in no civilized country to-day are tumours of the ovary of such colossal size seen as they are

in India. The tragedy of such enormous growths is that as a result of delay in seeking advice, secondary malignant changes occur.

Recently, with the help of Dr. K. Dutta, my registrar, I have analyzed my personal experiences of 547 cases of ovarian tumours, and have discovered that, whereas the incidence of a malignancy of such tumours in Europe is, according to Doderlein, 10 per cent. and Lippert, 15 per cent., with us malignant changes occur in 21·7 per cent. This is a very regrettable fact and should make you fully understand that under no circumstances should procrastination be countenanced once a diagnosis of ovarian tumour has been made. Moreover, apart from the question of malignancy, an operation with a negligible mortality in Europe becomes a serious matter in India when the patient is cachectic as a result of carrying an enormous tumour for months and may be years. My mortality in a consecutive series of 342 benign ovarian cases was 2·9 per cent. The mortality in 95 malignant tumours was 24·2 per cent, the death rate in 100 broad ligament cysts being 7·2 per cent. The technique employed I can show you any week of the year if you will attend the hospital and this was published in the Indian Medical Gazette, 1931. There is just one practical point, however, I might mention, and that is, you should suspect malignancy if there is tenderness, fixation and pain in the tumour, together with a low degree of fever and ascites.

AN EASY METHOD OF STERILIZATION PER VAGINAM

Every gynaecologist must perforce be something of a psychologist, as he becomes involved in the problems of modern married life, with its necessity for continence or contraception. In the tropics this problem is made more pressing by poverty and sickness, and the necessity of migration to England or the Hills, but these considerations should not weigh with us against the balance of conscience, equity and our oath. My opinion is that Nature must take its course provided there is no medical reason against this. But if a woman desires to have no more children, then with the written consent of her husband there is no reason why she should not have her tubes permanently ligated as a prophylactic measure. This is an easy operation, which should be possible for any gynaecologist to perform *per vaginam*.

After making a vertical incision down the anterior wall of the vagina, the bladder is pushed up; the utero-vesical peritonium will then be seen. It is picked up with two pairs of forceps, and made to resemble the frænum of the tongue and is cut with scissors. The anterior surface of the uterus is then

grasped with a 'cat's paw' and brought down; the tube on one side is caught with a long forceps, pulled down, tied in two places, and cut. The other tube is similarly dealt with. The utero-vesical pouch can then be sutured, and the wound closed. But what I prefer to do is to pass two interrupted catgut sutures through one side of the vaginal flap, transfixing the anterior surface of the uterus low down and enclosing the two leaves of the cut utero-vesical pouch, the sutures emerging on the other vaginal flap. When these two ligatures are tightened, not only is the anterior pouch closed, but the uterus is anteverted. The vaginal incision is then sutured with continuous catgut. The patient is allowed out of bed on the fifth day and goes home on the seventh.

This operation is very satisfactory and has no complications. It is important to be sure that the tubes are ligated and cut, and are not mistaken for the round ligament. This mistake cannot be made if the tubes, which have a mesentery and are loose with a free margin, are brought down into the incision for inspection before ligation. Sometimes, when there is retroversion of the uterus, it is wise to vary the operative procedure by doing a vaginal shortening of the round ligaments, either by performing a so-called anterior Baldy-Webster operation, or by suturing each round ligament to the anterior vaginal wall.

VAGINAL HYSTERECTOMY

Since 1928 I have done 136 vaginal hysterectomies with one death only. But for some reason vaginal hysterectomy is dreaded by gynæcologists in India, and yet it has a peculiar attraction for women in the tropics, who will readily face anything that can be performed from below rather than *per abdomen*. Doyen, the great French surgeon, used to say: 'No man should call himself a gynæcologist who cannot perform a vaginal hysterectomy in private'. But surgeons who are quite adept in the valleys and dales of the abdomen tremble and sweat when working anatomically *per vaginam*, for they are unable to visualize upside down. And yet there is no need to be afraid; tissues are cut, vessels are tied and fascial planes are opened exactly as in performing a complete hysterectomy from above.

In the tropics uterine fibroids are extremely frequent and make up some 10 per cent. of all operations. They are found in the multipara as often as in the nullipara, and cause much hæmorrhage and invalidism. Unless in very fat or debilitated patients, they are better treated by operation than by radium, for radium has suffered the fate of every other new remedy in the tropics. It has been used indiscriminately without regard to pathology and symptoms, with the result that in some cases

intense inflammatory reaction has occurred; in others, where adomyomata existed, bleeding, growth and pain increased; in a few, sloughing, accompanied by a stinking discharge, has continued for months. If fibroids are not bigger than a 3-months' pregnancy, in a large proportion of cases they can be removed vaginally, provided the surgeon is accurate and fearless in his diagnosis and technique. In a small percentage there may be slight old salpingitis or adhesions between the pelvic wall, but never yet have I found difficulty in separating these adhesions, or been prohibited from finishing any operation vaginally, and compelled to open the abdomen.

In my last 136 vaginal hysterectomies 56 have been performed for fibromata and 21 for ovarian menorrhagia, *i.e.* a form of hæmorrhage associated with ovarian dysfunction in which the follicular hormone is in excess or there is absence of the corpus luteum. In 17 the operation has been connected with what I might call the 'precancerous cervix', *i.e.* a cervix everted, hypertrophied, eroded and lacerated up to the internal os, bleeding readily at touch and causing anæmia, menorrhagia and distress, for many days every month. Cancer of the cervix is astonishingly common in the tropics, and this type of cervix is the soil upon which it starts and thrives.

Three cases have been more than usually interesting in that the operations were performed for chorion-epithelioma, subsequent to hydatidiform mole. In one case a girl had twice been curetted for hæmorrhage subsequent to the evacuation of a vesicular mole, and on each occasion the pathologist found no evidence of malignancy. Later she came into hospital almost exsanguine. A Zondek-Ascheim test was positive; therefore chorionic elements were present. I gave her 18 oz. of blood into the vein and did a vaginal hysterectomy the next day. She went out of hospital perfectly well and reported alive one year later. The other two cases are alive two and three years later respectively. In five cases the operation was performed for cancer in the body of the uterus, the tubes and both ovaries being removed at the same time.

In 11 cases the Mayo operation for complete prolapse was performed. The patients were all old women in whom the operation could be performed in a few minutes without bleeding or shock, compared with that of the Fothergill operation. Only once have I injured the ureter and once the bladder. You need never be afraid of hæmorrhage, or shock, or sepsis. There are a few points of importance which I stress:

1. Always double ligature the uterine artery.
2. Always remove both the tubes, for they tend to prolapse later into the vaginal wound if you do not.

3. Always join the bases of the two broad ligaments so that they form an antero-posterior bridge across the pelvis, and thus prevent vaginal hernia later.
4. Always use stout 21-day catgut, and bring the long ends of these catgut threads through the centre of your wound to promote capillary drainage.
5. Be sure there is no bleeding in either *fornix* before closing the pelvic cavity.
6. Always bring down the peritoneum of the base of the bladder to the edge of your vaginal incision and suture this with interrupted ligatures to the posterior vaginal incision, leaving half an inch gap in the middle line for drainage along with the catgut threads.
7. Put in a self-retaining or soft rubber catheter for 48 hours.
8. Fill the vagina with 1 in 100 brilliant green and then plug it tight with several strips of gauze. This is kept in for 24 hours and then removed, the patient being douched twice daily with hot saline for the next six weeks. The catgut then comes out of its own accord and the wound is healed.
9. My patients get out of bed on the 9th day, and usually leave hospital on the 12th.

The operation is not difficult provided the pouch of Douglas and the utero-vesical pouch are quickly opened. The latter incision apparently is a bugbear to the beginner, but having made the cervical incision, if you boldly push up the bladder you will see the thin, fishbelly-like membrane of the utero-vesical pouch. Put in an anterior retractor and then cut this as if it were the frænum of the tongue and you are in the peritoneal cavity. From then onwards the operation is merely a matter of adroitness and anatomy. The mortality of my last 286 cases of vaginal hysterectomy was 0·7 per cent. A majority of these patients would have never submitted to any abdominal operation. I am not in favour of radium, partly because of the expense, and partly because my experience has given me small confidence in its use.

During the period in which these 286 vaginal hysterectomies were done, 435 subtotal and 366 total hysterectomies were performed, with a combined mortality of 7·17 per cent. Such a mortality for abdominal hysterectomy may give rise to criticism as compared with the 2 to 3 per cent. mortality in Great Britain, but gynæcological surgery is only in its infancy in the tropics, and India is only now entering that era which

began in England with Lawson Tait and Spencer Wells. The great majority of uterine tumours that present themselves are in patients old, debilitated and grossly anæmic. Indeed at times it needs no little temerity to attempt any operation. With the passing of the purdah system and the growth of education women will demand surgery in the early rather than the late stages of disease.

OPERATIVE RESULTS

Polak in a very interesting paper has analyzed 95 deaths out of a total of 3,125 patients, operated upon. He considers that the fatal issue can be attributed to one of the following causes:—

- (a) Employment of the high Trendelenburg position in a patient with high blood pressure produces cardiac embarrassment and the prolongation of this posture in patients with low blood pressure increases the occurrence rate of shock. This information is of particular importance to us in India.
- (b) Too much surgery has been done at one sitting.
- (c) The time consumed in operating has over-reached the maximum of safety.
- (d) Forty-eight hours' rest is imperative before any major operation. This rule is frequently disregarded in India.
- (e) Patients who have been the subject of prolonged infection and have either a high or low leucocyte count, and particularly a low polymorphonuclear count, have a poor reaction to operative procedure. The optimum leucocyte count is 7 to 10 thousand, and the optimum polymorphonuclear percentage is 65 to 80.

He lays stress on the importance of every patient taking not less than three quarts of fluid (water, milk, fruit juice) per day for 2 to 3 days before operation, and considers that during this period the usual cane sugar intake of the individual must be quadrupled. This latter statement is of interest to the writer, for he has during many years insisted on all patients about to undergo major operations, taking 3 to 4 ozs. of natural honey (modhu) for 5 to 7 days before operation in order to increase the liver glycogen reserve, and inhibit the risks of acidosis and shock, and his results have justified the procedure now advocated by Professor Polak.

It is interesting to observe that 8 of the deaths recorded were due to paralytic ileus. Such ileus is due to partial obs-

trusion, for although there may be a passage of gas from the rectum, and even bowel movement, vomiting continues and the gas tympanites quickly re-accumulates.

In such cases the pulse and temperature are not much alleviated, yet regurgitant vomiting continues and gas pains persist. The only treatment is early exploration under local anæsthesia, when it will be revealed that there is some loop of the intestine slightly adherent to the abdominal wall or to a point in the operative field. Release of this, with or without puncture enterostomy, or cæcostomy, will save the majority of these patients, if only the surgeon has the courage to do so immediately a clinical diagnosis is made. Professor Polak is definitely against operation in the acute or sub-acute stages of adnexal infection. Should operation, however, become imperative because of pus formation, or obstructive peritonitis, he advocates only simple drainage from above or below.

PROTEIN THERAPY

It has been shown by Hollar, Weiss and Hibbert that the effect of the injection of foreign protein is:

- (1) to increase the function of the hæmopoietic organs;
- (2) to increase the number of phagocytes in the blood stream;
- (3) to increase the number of active antibodies in the blood.

Protein therapy is a very useful adjuvant to gynecology for those complaints which give rise to suffering, but for which operation is inadvisable or not imperative. For instance:—

- (1) The fixed, tender, enlarged, displaced uterus.
- (2) Tender and enlarged tubes and ovaries, accompanied by occasional fever.
- (3) Thickened and tender utero-sacral ligaments with sacralgia.
- (4) Tenderness and thickening at the base of the bladder.
- (5) Parametrial exudates.

In hospital practice I use plain freshly boiled skimmed milk, but in private a preparation known as Aolan. The first dose, given intramuscularly, is 5 c.c. and after that 7 to 10 c.c. are given every four days, or six doses in all. From a detailed consideration of a great number of cases, I am satisfied that this treatment is of great value. Indeed it is surprising to discover by palpation that after this more or less painless treatment, exquisitely tender inflammatory exudates have melted

away and to hear a patient voluntarily tell one that the pain and backache have disappeared. The greater the reaction, the better the result. In the case of tubo-ovarian mass, pending operation, it is of value because whilst marking time it raises the resistance of the patient.

ABORTION¹

To-day it is my intention to deal with the subject of abortion, my reason for this choice being the words of Dr. Johnson: 'Wisdom is the daughter of experience'.

Abortion is one of the most common emergencies of private practice—and its complications are of the things which call you out in the middle of the night—for that reason I thought you might learn something from a fresh consideration of the subject.

It is not sufficiently appreciated how serious a matter abortion is at the present time. Two in every hundred women who miscarry die, and quite 800 women succumb every year in Great Britain of abortifugal sepsis or hæmorrhage.

I want you to realize that only 40 per cent. of abortions are spontaneous, and it is these spontaneous ones which hardly cause you anxiety; for such patients rarely get fever, or severe hæmorrhage.

60 PER CENT. OF ABORTIONS ARE INDUCED.—It has been said that woman is an example of the most confirmed optimist; for she who becomes pregnant and does not want to go on with it will swallow anything, from ink to a cannon ball, in order to get rid of it; or will insert into the vagina anything from a tent to a statue of Napoleon, to bring abortion about. The 60 per cent. in whom it is induced are the danger ones. Some of those dangers I shall mention presently.

With regard to this business of induction, I want you to realize primarily that until contraceptives are 100 per cent. efficient, or until the law of England is altered, or until we ignore the Hippocratic Oath, we shall continue to meet with cases of induced abortion in all our big cities. We are not likely to have the law of England altered, and no contraceptives are 100 per cent. certain; and I trust we shall never forget our Oath.

But remember of the abortions which you will see in private practice, 80 per cent. will be incomplete, in other words, will cause you anxiety. Only 5 per cent. of abortions are threatened,

¹ A Post-Graduate Lecture delivered at the West London Hospital, Hammersmith.

and that is important, because a woman who is anxious to have a baby and has a little bleeding within a day or two of the wanted time, if she were not pregnant, will want to know whether she is likely to abort. One clue which will tell you whether that is probable is the presence of pain. If she has pain, with a little bleeding or staining of her linen within three or four days of her expected time, you may be sure she will miscarry.

I do not propose to go over with you to-day the varieties of abortion; you know them; nor shall I inflict on you the various causes, except that I want you to remember a very old mnemonic, which is known as T U T O. In this, T stands for trauma, and the most important trauma is the shaking the uterus may get from enormous doses of quinine, pennyroyal, purges rhu, etc. U, *i.e.* uterine causes, explain themselves: fibroids, etc., possibly retroversion and adhesions. T stands for toxæmia, those cases caused by syphilis, nephritis, lead, diabetes, exophthalmic goitre, etc. O stands for ovarian and endocrinous causes, and these we shall speak of when dealing with habitual abortion.

The first thing I want to stress is Curtis' rule, or, as it is spoken of in America, Curtis' law. It runs thus: If you know or suspect that a woman has procured abortion on herself, do not interfere actively or surgically in any way until her white cell count and her temperature have been normal for five or six days. The rule is based on the pathology of the living. A professional abortionist may pass a sound into the uterus and that sound may pass through a septic cervix and will probably carry organisms into the neighbourhood of the decidua. He may pass an instrument once into the pregnant uterus with safety and nothing will occur to the patient; but if the abortionist passes an instrument another day, that woman may die. What is the reason? When the abortionist passes the instrument it goes through a septic canal, and carries organisms to the neighbourhood of the ovum. Those organisms get more or less surrounded by leucocytes or by a barrier, and are sealed off. The patient has a little temperature or a little discharge for four or five days, and eventually the family doctor is called in; he probably sees the patient and suggests that, as she has constant bleeding and a little fever, that the uterus should be evacuated. He may or may not know that abortion has been attempted—he or the hospital does the seemingly innocent and small operation. The organisms are in pure culture. He breaks down that barrier, the organisms dash into the circulation, and the patient will probably be dead of septicæmia in four or five days or weeks. Curtis' law is based on pathology and bacteriology, and is of tremendous importance to the general practitioner. You know the patient has got a blood

discharge and the temperature is up, and you incline to say, 'Now that your temperature is so and so, I think we must interfere.' You take her into a nursing home, or you do it in her house, and you attempt to free the uterus of its contents. You liberate the bacterial content into the uterus, blood stream, or cellular tissue, and the patient may die or be dreadfully ill for weeks or months.

The next rule you have to remember, is that known as Schaefer's rule. Professor Schaefer, of Edinburgh, did some very interesting experiments some years ago, and they were as follow: He injected into the uteri of monkeys and sheep a pure culture of streptococci and staphylococci and nothing happened. He injected into another series of animals a pure culture, in blood agar, of gonococci, and the animals developed acute gonorrhoeal pelvic peritonitis. That experiment shows you that the streptococcus and the staphylococcus will not do any harm to anybody unless the mucous membrane is abraded, whereas the gonococcus does not need such abrasion; all it needs is a continuity of mucous membrane in order to spread through the tubes into the peritoneal cavity and cause pelvic peritonitis.

Then came Whitehouse's experiment. This was equally important. Whitehouse took a monkey and a sheep and injected into the cellular tissue of the uterus a pure culture of gonococci, and nothing happened, the reason being that the gonococcus will not grow in cellular tissue. He then injected into the cellular tissue of a monkey and a sheep a pure culture of streptococci and at once there was an enormous parametrial cellulitis, or what was called when I was qualifying, a 'parametrial phlegmon'. The experiment showed that streptococci have an affinity for cellular tissue, whereas the gonococcus has no affinity for it.

What are the dangers of abortion to-day? The main danger of procured abortion is a generalized septicæmia, i.e. the organisms passing through into the lymph and blood streams.

The next most common danger is that you as a general practitioner doing your best, or the abortionist doing her worst, may perforate the uterus, and there results a general peritonitis, which is almost invariably fatal, unless seen early, and immediate drainage suprapubically and by posterior colpotomy done.

The third danger is, that if the midwife, or doctor, with the best intentions to empty the uterus, with a vulsellum on the cervix lacerates the cervix or uterus with instruments or

dilators—and she has been infected by a strain of streptococcus, say, the hæmolyticus—where that laceration occurs he or she may directly infect the cellular tissue, as Whitehouse infected the cellular tissue of his experimental animals, and the result may be that that patient develops an acute streptococcal parametrial exudate, which may proceed to the formation of an abscess in the broad ligament or by extension in the pouch of Douglas, or in front of the uterus.

Another condition may result, namely, that the acutely inflamed uterus, after the operation may become retroverted and fixed, causing much pain, dyspareunia and one-fertility sterility. It is a disability which is of great seriousness. To-day many a woman is suffering from what is known as 'one-fertility sterility'; meaning that is, that her tubes become permanently occluded, as a result of septic complications after an induced abortion, shortly following marriage.

Cases of *spontaneous* abortion present only one danger, and that is hæmorrhage. When you are called out to a case because of hæmorrhage it is almost certainly an honest one. Spontaneous abortions give you trouble from hæmorrhage, whereas induced ones give you trouble from sepsis.

What is the treatment to-day? I say 'to-day' because the treatment is different now from what we were taught five or six years ago. The treatment of a patient who has had an induced abortion is conservative masterly inactivity. She is put to bed and is not given anything, except morphia to keep her quiet and plenty of glucose and alkaline drinks. You may put a hot-water bottle on her abdomen, and keep her bowels acting regularly. If you like, you may put some glycerine into the uterus, but not under pressure, and you may give her 10 c.c. of nolan every third day. The bed is slightly raised at the head. Do not use any form of douching. Ergot and pituitrin may be ordered. Never plug the vagina. It is important to remember that 70 per cent. of these cases so treated empty themselves without the medical man touching them. On the other hand, if you treat the case on active lines do not be surprised if, on the following morning, the patient has a rigor, and that you run the risk of being hauled over the coals by the coroner, for you may even be held responsible for having killed the patient. And here we arrive at a point I particularly want to stress. If you ever see a woman whom you suspect has had a septic abortion, I want you to promise me that you will call in a colleague, he need not be a specialist; get your best friend in the district to see her with you. I say this because if she dies, it is quite certain that somebody in the neighbourhood will say you did the abortion on her. And if you cannot get such a patient into an institution—and there

is not room for all of them—have a nurse night and day. Queen Charlotte's are willing to take such patients in.

Those cases are extraordinarily common in London at the present time, and this will continue to be the case.

At the end of five or six days—remembering Curtis' rule—if the temperature is constantly normal and the blood count is normal, you may, if you suspect retained products of conception, give the woman an anæsthetic, put in sponge-holding forceps, and gently tease out the uterine contents. The index finger is the only arbiter I know, of an absolutely empty uterus, but, if you please, no curetting. The reason being that if you curette you will probably go through the fundus of the uterus, and the patient will die. The uterus, under the conditions I am describing, resembles in consistence wet blotting paper. Moreover, the curette will break down Nature's leucocyte barrier.

If the miscarriage is spontaneous, and hæmorrhage perhaps is severe, then of course you *must* treat her and can treat her surgically and without fear, by dilatation and *complete* evacuation of the uterus under anæsthesia. But be sure the uterus is empty with your forefinger.

When a patient has sustained a perforated uterus and you know she is septic. (The woman whose specimen I show you developed a temperature of 106° F., and died on the 7th day.) In such a case we do not remove the uterus, but open the abdomen a little below the umbilicus and put a tube down as quickly as possible to the utero-vesical pouch, then put her in the lithotomy posture and do a posterior colpotomy. In this woman that measure was undertaken too late. In these cases I prefer spinal anæsthesia. Never do a hysterectomy.

HABITUAL ABORTION.—I want to talk about this condition, for in private work it is a bugbear to the practitioner. A patient says, 'Doctor, I do not know why it is, but once or twice a year I go ten or twenty days over my period and feel sure I am pregnant, and then the period begins all over again and is profuse'. Another type will say, 'I miss one or two periods, and then, to my chagrin, the thing all comes away'. That may have occurred two or three times. To-day I saw a lady who was sent to me by a doctor. She had had three abortions, the last in Venice five months ago. She is young and is very anxious to have a baby.

What is the cause of 'habitual abortion' in perfectly healthy women?

Normally the ovary sends folliculin to the uterus, and it causes growth, hyperæmia and contraction. Every woman

during her so-called ovulation period, i.e. when the Graafian follicle is swelling, is sending into her general circulation, and particularly to the uterus, a hormone, folliculin. The function of contraction is important because it drives the ovum along the tube towards the fundus of the uterus until three to five days before menstruation is due, when the ovum finds its way to one cornu and the corpus luteum is fully formed, which manufactures a substance we call progesterin. This hormone immobilizes the uterus and neutralizes the effect of the folliculin upon the posterior pituitary body. From the point of view of treatment this is important.

Why do these women who are constitutionally healthy in every way have habitual abortions 10 or 15 days after the menstrual period has been passed, or even two or three months after? If you will do a Z-A test on such a patient you will probably find that that test is only slightly positive, meaning that the amount of progesterin and the amount of prolactin B circulating is deficient. It was Professor Johnstone and Dr. Weisner, of Edinburgh University, who were the first to make good this statement. They found that in women who have habitual abortions, if you tested their urine and injected it into rabbits or mice, instead of getting a perfect Z-A reaction there was only very little reaction, showing that the amount of progesterin in these women is too little. And so you have here the first line of attack in the treatment of these cases. The line which is carried out in Edinburgh is to give these women injections of prolactin B, one of which is marketed under the name 'Antuitrin S'. You ask such women whether they are willing to come up for 10 to 20 intramuscular injections, and if so you can carry this treatment out. The material is obtainable from Messrs. Parke Davis, it is not expensive and is given intramuscularly.

The next line of research hails from Germany. It was found that these women who habitually abort have a very low basal metabolism rate; they also have a minus hæmoglobin and a minus lymphocyte count as a rule.

This condition of habitual abortion *plus* anaemia, *plus* deficiency of lymphocytes, is the same which you see in Fröhlich's syndrome, and in certain tumours and diseases of the hypophysis. So you have a line of treatment there. And the treatment is to give them $\frac{1}{2}$ gr. doses of thyroid, because thyroid gland is useful in conditions of hypo-pituitarism and hypo-adrenalism. At the same time, the diet is carefully regulated. You also should give iodine in some form; I prefer syrupus ferri. iod., half a teaspoonful once a day in milk or sugar. I have had quite a number of these cases in the last two or three years, and I have been surprised to see what a large

proportion have gone to term without aborting. They should take the thyroid and iodine for three—six months.

Before you make a diagnosis of habitual abortion you must examine the pelvis thoroughly, because a large number of cases of so-called habitual abortion miscarry, not because their metabolism rate is low, or that they have a deficient hæmoglobin or leucocyte rate, or a deficiency of progesterin, but because the cervix is septic; if you will put in a speculum you will understand why they abort; it is because the germs from the cervix are carried in with the sperm cell and so set up deciduitis—such a cervix should be first treated by the electro cautery or a Sturmdorff operation. Never paint it, that is tinkering gynæcology, and an unworthy method to-day.

On the other hand, the case I show you an illustration of, had a retroflexed uterus lying up against the rectum. She was unable to carry any pregnancy longer than seven weeks, because directly the uterus enlarged it pressed up against the rectum, causing tenesmus and bearing down pain. This type can be readily cured as you know, by a Gilliam operation. But she preferred her habitual abortions!

STERILITY: YESTERDAY AND TO-DAY

A witty Frenchman once said of the English that they had fifty different religions, but only one sauce. And I think one may say of the general practitioner that he has fifty different nostrums, but only one operation, for sterility.

With a view to correcting this misconception, it may be of some service to review our knowledge of the matter in the light of recent work, and particularly with reference to the value of the Rubin per-uterine tubal insufflation test; for with the onset of the cold weather, many a soul is left disappointed, and many a practitioner left distracted, when Time—the arbiter of all things—proves that conception has not occurred.

The types of sterility that I am going to discuss are those seen every day by the busy practitioner, and in order to make my meaning clear on this point I am taking for consideration 300 consecutive cases, as they have presented themselves to me in my consulting room.

In 64 of these (21·8 per cent.), the husband was at fault.

In 50 (16·8 per cent.), no satisfactory cause could be discovered in either husband or wife, after full examination.

In 45 (15 per cent.), the complaint was one-child sterility.

In 141 (47 per cent.), the fault was primarily or certainly in the woman.

Such being the case, it will repay us to halt, and consider each of these categories.

As regards the first, the husband may be old, or he may have a history of epididymitis, or syphilis, or he may be psychopathic, or unintelligent in the art of love. Such cases can easily be investigated by efficient examination of the semen in a condom. Such examination must be done within a very few hours of coitus.

Azoöspemia is in my experience incurable; but I have seen excellent results following rest, mild thyroid medication, and diathermy, in oligospermia. Total abstinence, and if possible separation of the parties for not less than three months, must be a part of the treatment. Some of these cases are complicated by a very definite psychological complex; by this, I mean that due to some subconscious trauma of earlier days, which has not been ventilated, a man may develop an anxiety neurosis or inferiority complex. These cases are best dealt with by an expert psycho-analyst. However, I wish to make it quite clear that the most intimate enquiry must be made of, and about the husband, before necessarily proclaiming that the wife is the cause of the sterility. For I am afraid scores of women undergo unnecessary operations in order to bolster up the amour-propre of a defective husband.

In 50 cases no adequate cause could be assigned for the sterility, despite full examination of both husband and wife (including a Rubin test on the latter), but I have a feeling that a time will come in the near future when semen will be 'grouped' in some way to suit a woman, just as blood is grouped for direct transfusion. For from a knowledge of the private lives of some of these patients, I know that they have had left-handed children, or children by a former spouse.

Moreover, I feel quite sure that many of these cases are due to the prolonged use of contraceptives after marriage, for there can be no doubt that such abominations as quinine pessaries, cervical caps, etc., set up an endocervicitis, which is inimical to the passage and vitality of the spermatozoa. Indeed, I do not think the fact is sufficiently recognized that if women constantly use contraceptives during the first three years of married life, only a fractional proportion of them ever conceive. Some authorities state that only 10 per cent. of such become pregnant.

One-child sterility is very common among the people of India, and when it is remembered that 50 per cent. of Indian women and 12 per cent. of European women in India suffer from fever of some kind after delivery, such one-child sterility need not be wondered at. It may be that the perineum is so

badly torn or the vagina so lax that the patient is always wet after coitus, or there may be such atresia or laceration of the cervix with ectropion and erosion that the chances of fertilization are few, but most often there is a condition of chronic metritis, that is a congested, bulky, and retroverted uterus, with or without salpingo-oöphoritis, and this is the fundamental cause

The prospects of these patients are to a large extent dependent upon expert examination. For instance, the perineum or cervix may need suturing, or some plastic operation.

On the other hand, if there is old inflammatory disease of the tubes, which have become completely glued, and surrounded with adhesions to the ovary, no treatment for sterility *per se* will be of any avail, although of course operation may cure the chronic invalidism of these patients. But if there is no palpable disease—by this I mean that the tubes and ovaries are not enlarged or painful, and that the only finding is a retroverted bulky uterus (probably the result of inefficient treatment, or neglect of vaginal examination three weeks after the baby was born)—there are two things which can be done:

1. The diagnostic per-uterine insufflation test of Rubin.
2. Remington Hobb's treatment.

It is possible that the first, for lack of the adequate apparatus or experience, cannot be carried out, but there is no reason whatever why any practitioner should not carry out the Hobb's treatment, which is simplicity itself, for I have records already of 11 cases where this treatment alone has resulted in conception at a later date—cases in which every known treatment, even including that much-abused operation of Gilliam—has been employed.

Here, may I say in parenthesis, that the general practitioner's custom of ordering glycerine and ichthyol tampons, or inserting a pessary, is not only useless, but an anachronism to-day. And the same thing may be said of the embryo gynaecologist who believes that a Gilliam operation for a retroverted uterus is the *ultima Thule* of treatment, for in these cases, as the uterus is in a state of chronic congestion or sub-acute inflammation, no mere restitution of its position will influence its conceptive power. For as Rubin has demonstrated, and as I have incontestably proved, if CO₂ passes with ease through the tubes without undue pressure with the uterus retroverted, there is no indication for Gilliam's operation, if sterility is the purpose thereof; but, if the CO₂ does not pass easily or only passes under excessive pressure, or after first anteverting the uterus, one must presume that there is a mechanical

kink or swelling of the mucous membrane of the tubes, and then Hobb's treatment before or after a Gilliam operation is astoundingly gratifying in its results.

TILL HOBBS' TREATMENT.—The principle of this treatment is the introduction of glycerine into the uterus, which promote exosmosis from the endometrium, that is to say there is an outpouring of lymph from the uterus, and its place is taken by fresh lymph from the circulation. Glycerine is a mild stimulant to the uterine muscle, it rehabilitates its tone and contractibility, and as it slowly percolates through the cervical canal it washes out that viscid secretion, which so often blocks the entrance.

INSTRUMENTS REQUIRED:—

- (1) A sponge holder.
- (2) A No. 6 soft rubber Jacques' catheter.
- (3) A bivalve speculum, or a posterior speculum and an anterior vaginal retractor.
- (4) A 10 c.c. 'Record' syringe.

TECHNIQUE.—No anæsthetic is necessary. The patient is placed in the lithotomy position, the vulva is cleansed as usual, and the speculum introduced. The cervix is manipulated into a central position, and cleansed with a swab-stick and iodine. The 'Record' syringe is filled with pure glycerine, and the soft rubber catheter is attached to the end of the syringe. The catheter end is grasped lightly by the sponge holder, introduced into the cervix, and pushed right up to the fundus; the glycerine is then slowly injected, so that an even spread over the uterine mucosa is obtained. If the patient is in bed, the catheter is left *in situ* with gentle packing to keep it retained in the vagina, the treatment being repeated t.d.s.; but if not in bed, the patient should return for treatment every day, for not less than 21 days.

In Calcutta, I find it best to ask one of the many reliable lady doctors to carry out the treatment after the first application; that is after the patient realizes that there is no pain or disability entailed.

The patient is asked to report herself in a month, for by that time one usually finds the uterus small, mobile, and no longer tender to palpation. While this treatment is being carried out, the patient is told to take $\frac{1}{2}$ gr. of thyroid extract twice a day, to rest from 12 noon to 4 p.m. on her face, with the foot of the bed raised, and to submit to some form of Plombière treatment, that is to douche herself rectally with hot normal saline or 1 grain of permanganate of potash to 2 pints of hot water

twice a day, for many of these cases have an eczematous or varicose condition of the parametrium.

Coitus is absolutely forbidden for three months. The treatment is repeated on 15 days in the second month, 10 days in the third month. The husband is instructed to be with his wife on the 7th, 9th, and 11th days after the last day of the third menstrual period, for these are the days of elective procreation, corresponding with the date of ovulation in women, which takes place between the 18th and 17th days after the first day of menstruation.

It may help to emphasize this fact, if the practitioner will remind his patient that the Jews are the most prolific race in the world, and that the Mosaic law does not permit the orthodox Jew to cohabit with his wife until after the 7th day following the last day of menstruation.

Before quitting the subject of Hobb's treatment, I should like to add that this treatment, so simple and efficient for drainage of the uterus, is of extraordinary value in cases of puerperal sepsis, for each application relieves congestion, lowers the temperature, and alleviates pain. Moreover, it is very useful in cases of abortion with retained products of fertilization which have become infected.

Finally, in cases of one-child sterility, where all treatments have been tried, reference should be made to the modern treatment by diathermy. This method should only be used by an expert, but the reports of such cases as have been treated show that it is a very valuable means of restoring health to a tender, congested uterus, thereby perhaps rendering the nidus for conception normal.

FAULTS IN THE WOMAN.—From a clinical point of view, such faults can be divided into psychological, anatomical, and pathological. Out of the 141 cases seen by me, 11 (7·8 per cent.) belonged to the psychological category, by which I mean that extreme frigidity or vaginismus existed. These cases are very difficult to treat, since as a rule there is no anatomical defect or cause for such reluctance.

Suggestion, mental massage, or vaginal glass dilators before, or after a 'Fenton' operation are sometimes successful. Little can be expected of drugs such as valerian or nux vomica, for it is the art of love that is defective in the husband or wife, or both.

ANATOMICAL DEFECTS are in my experience very common; 63 cases (44 per cent.) had defects of the vagina, cervix, uterus, or its adnexa.

Developmental errors are far more frequently causes of sterility in women than practitioners realize, and it may be that faults in development are results of dietetic errors (avitaminosis), together with endocrine failure in foetal or early life up to the age of puberty.

Gross clinical conditions, such as congenital absence of, or non-development of the sexual organs; or lesser ones, such as the tented vagina, that is one contracted at its vault, the snout-shaped or button cervix, the anteriorly or posteriorly acutely flexed cochlinate uterus with small insensate ovaries, or the small round pelvis, are all frequently seen.

Dysmenorrhœa is usually a symptom, and such patients often are obese below the navel, and have a failure in development of the breasts, pubic or axillary hair. Some are short, and have loose joints, and large tonsils. Others have absence of the half-moons of the finger-nails, or small black moles (beauty spots) all over the body, or spaced and twisted upper lateral incisor teeth. These accessory clinical signs point to hypothyroidism, or hypopituitarism.

Treatment of these cases is extremely unsatisfactory from the point of view of curing the sterility. Perchance $\frac{1}{2}$ gr. of thyroid extract twice a day, with large doses such as 10 grs. each, three times a day, of whole ovarian and pituitary extract for six to twelve weeks, may be beneficial. I have only known two of these patients to become pregnant and go to full term, although such symptoms as dysmenorrhœa, obesity, and dyspareunia may be alleviated.

PATHOLOGICAL CONDITIONS OF THE PELVIS existed in 67 (48 per cent.) of the whole number of cases seen by me.

A careful history will elucidate whether a patient at any time since marriage has had any inflammatory condition of infective origin which might possibly have affected the genital organs and pelvic peritoneum. For instance, 18 cases gave a history suggestive of gonococcal infection; 7 had a history of severe appendicitis and operation in the acute stages; 11 had a history of abortion followed by fever for periods from 8 days to 8 weeks; 2 were definitely tubercular, and their pelvic findings suggested tubercular salpingitis; 8 had had operations for extra-uterine gestation.

Pelvic examination will demonstrate morbid conditions of the urethra, Bartholin's glands, or cervix; for instance, a hypertrophied, oedematous cervix eroded, and with a bull's eye appearance points to an infective condition of the endocervix. Bimanual examination will at once give the clue by pain and tenderness as to the position and condition of the uterus, tubes,

and ovaries, for any inflammatory condition, old or recent, of these structures will be palpable, and should the practitioner be in doubt, a combined vaginal and rectal examination will clinch the diagnosis as to the cause of sterility.

That tubo-ovarian disease, inflammatory in origin, is extraordinarily common, both in private and in hospital practice cannot be doubted. Among my own cases they form 12·7 per cent. of the whole, and in the Eden Hospital, Captain Dutt, the Registrar, shows that they form 18·6 per cent. of all gynaecological outpatients.

Other morbid conditions causing sterility, under the age of 28, or after three years of marriage, were ovarian and dermoid tumours, 9 in all.

But still more common in my series were neoplasms of the uterus (17 in number) including polypi of the cervix or fibroids of the corpus uteri.

In a few patients, although the history was suggestive of infection or definite of abortion, except for a retroverted uterus and prolapsed ovaries, no other morbid condition was discoverable.

TREATMENT.—An infected cervix by itself may be cured by diathermy, or by Hobb's treatment, or if these fail, by a Sturmdorff operation, which excises the mucous membrane of the endocervix.

A tubo-ovarian mass may eventually demand operation, but such treatment is very rarely followed by conception. In connection with these operations it may not be out of place here to sound a warning against laparotomy should there be a history of a miscarriage or abortion within the year, for 'puerperal' tubo-ovarian masses are in 80 per cent. of cases streptococcal in origin, and hence there is a risk of infecting the peritoneal cavity and death.

The cases which demand the greatest clinical acumen are those in which the history is indefinite, the clinical findings are negative, and where apparently there would seem to be no reason why conception should not have occurred. It is in these patients that the value of the Rubin insufflation test gives us that hope and information, which hitherto we have had no means of entertaining.

In 1914 Rubin first began his experiments on insufflation, and now the technique is so perfected that the gynaecologist can use it in his consulting room as a routine method of diagnosis in cases of sterility, provided that his technique is good, that

the patient is seen at a favourable time with regard to the menstrual cycle, that the cervix is healthy, and that there are no contra-indications.

The writer uses Rubin's own apparatus or that of Dr. Provis. These are both portable and inexpensive. No anæsthetic is necessary, in fact an anæsthetic should on no account be used. A vaginal examination having been made to eliminate any contra-indications, the patient is placed in the lithotomy position, a bivalve speculum is inserted, the cervix is grasped by a single pointed vulsellum, and cleansed with iodine on a probe. The cannula connected to the CO₂ apparatus is now passed into the cervix above the level of the internal os. The CO₂ cylinder is connected with a pressure gauge and the CO₂ passed through an inverted U tube in water. The gas is now turned on at a very slow rate (approximately three bubbles to the minute), and the manometer is closely observed in order to determine the point at which the pressure drops. This 'pressure drop' indicates the point at which the gas is released through the tubes into the peritoneal cavity. If the tubes are patent, this is usually under 100 mm. of mercury. If the tubes are closed there is no drop, and the pressure rises steadily to 200 mm. or more. The cannula and vulsellum are then withdrawn. The patient is asked particularly as to the character and location of any pain produced, as such points are of diagnostic value. For instance, if the pain, as the pressure rises, is only in the middle line, or on one or other side of the groin, the probabilities are that there is a block in one tube or both, as the case may be.

If the gas has run through at a pressure of 100 mm. or less, and not more than three bubbles emitted per minute (roughly 100 c.c. of CO₂), the patient is asked to sit up on the couch. Confirmatory evidence of the patency of the tubes will be then established, for she will complain of sudden pain in the right or left shoulder region, due to rising of the gas under the diaphragm. (Rubin uses a fluoroscope, which he has fitted up in his consulting room.) Such pain can be abolished by asking the patient to adopt a knee-chest position for five or ten minutes, for the CO₂ then reverts to the pelvis and is quickly absorbed.

CONTRA-INDICATIONS AND DANGERS.—There must be no evidence of pelvic infection or suppuration, no pelvic tenderness, or inflammatory masses, and no fever. She must not be a patient who is suffering from cardiac, renal, or pulmonary disease, nor be one of great obesity. The danger of embolism is negligible if the test is done properly. The only possible danger is an extremely rare one, namely, that of blowing pus from the tubes into the peritoneal cavity, either through the fimbriated end, or from the bursting of a tube under excessive

pressure. But this should not be possible if a proper examination has been made beforehand.

CHOICE OF TIME.—The most favourable time to carry out the test is from 4 to 7 days after the cessation of menstruation, when the endometrium is flat, and the uterine ostia of the tubes are not obstructed by swollen mucous membrane. Moreover, such a time is of additional importance from the fact that if the test is positive the husband can be with his wife during the following three nights with a greater chance of conception occurring.

REPETITION OF THE TEST.—If the test is negative, on no account should the patient be told that conception is impossible, for although circumstances may predispose one to think so, it may be that there has been some spasm of the tubes during the test, which has prevented the passage of the CO_2 . For that reason the test should be repeated on two or three occasions, under morphia and atropine if need be. Rubin himself states that several of his patients proved to have tubal patency on a fourth test and subsequently gave birth to normal children. Moreover, it may be that the second and third tests indicate from the symptoms of the patient that the block is at the distal end of the tube, the so-called 'phimotic' tube adherent to the ovary. In such a case, laparotomy, followed by salpingostomy and removal of the thickened outer covering of the ovary, may be successful.

DEDUCTIONS.—Until recently the operation most beloved of the general practitioner for sterility was that of dilatation and curetting, with or without slitting of the posterior lip of the cervix. Should this small operation fail in its purpose, the patient usually drifted to the gynaecologist for further opinion, and if he found the uterus retroverted some modification of Gilliam's operation, perhaps, would be performed; but should the uterus be in its normal position—which was as likely as not—and the husband healthy, another dilatation would be done!

Nowadays, however, all such tinkering gynaecology has gone by the board, for obviously any operation on the cervix or uterus will be ineffectual if the tubes are already sealed to the passage of the ovum.

Rubin's test is therefore a diagnostic measure of the very greatest importance; so should any patient with a healthy husband, after two or three years of marriage, seek advice for sterility—provided that there are no contra-indications—an insufflation test should be done before submitting her to any operation.

Moreover, it must be remembered that this test, if positive,

has also a therapeutic effect, for the observations of over twenty independent surgeons have proved that this test alone, without any other treatment whatever, has resulted in conception in over 10 per cent. of sterile patients—probably by dislodging a plug of mucus or straightening out a kink in the tubes.

If the test is negative on three or four occasions, the probabilities are very much against any chance of conception—operation, or no operation. For instance, the writer has done 33 salpingostomies, and has yet to see one of these women become pregnant, and this is the usual experience of most surgeons.

If the test is positive, on the other hand, any measure should be taken which may enhance the chances of fertilization. For instance, Hobb's treatment of uterine drainage for a bulky congested uterus, a Gilliam or Sturmdorff operation, or trachelorrhaphy, or sometimes the simple operation of dilatation and curetting.

Never insert a pessary for retroverted uterus associated with sterility. In those cases where the uterus is mobile, retroverted and the tubes are patent, but an abdominal operation is not desired, excellent results may be obtained by adopting a modification of the technique devised by the late Dr. Williamson. A T-shaped incision is made in the vagina in front of the cervix, the bladder is pushed up and the anterior peritoneal pouch opened. The anterior surface of the uterus is lightly grasped with a single pointed vulsellum and brought forward. Catgut sutures, two or three in number, are now passed horizontally from side to side through respectively the pubo-cervical fascia, the cut edges of the anterior vesical peritoneal pouch, the sub-peritoneal surface of the uterus one inch below the fundus, and then emerge through the same structures on the opposite side. The ligatures being tied and the wound closed, the uterus is now anteverted and held forwards by a light adhesion of peritoneum which is in the nature of a vaginal suspension ligament. The writer has done this operation on a great number of occasions for prolapse of the ovary, dyspareunia or sterility. In a small proportion recurrence may occur due to faulty ligatures or faulty adhesions but in no case has abortion occurred. Eleven cases have gone to full term and had no difficulty whatever at delivery. In 5 of these however, the uterus had dropped backwards after the childbirth and had to be temporarily rectified by pessary. The operation is not difficult, is painless, and keeps the patient in bed only 8 to 10 days.

As regards the operation of curetting and dilatation which undoubtedly is occasionally followed by conception, it is the opinion of the writer that such success is due to four factors: (1) suggestion; (2) removal of unhealthy or callous mucous

membrane; (3) relaxation of the spasm of the circular fibres of the cervix; (4) the fact that the passage of solid Hegar's dilators up to 11/14, probably forces a column of air which is in 'the cylinder' of the uterus through the tubes and acts like an insufflation. This column of air possibly dislodges a plug of mucus which has been blocking the tubes hitherto, for undoubtedly slow dilatation of the cervix with Hegar's solid instruments is followed by greater success than the use of tents or of Hawkins-Ambler's hollow dilators.

From the above facts it will be seen that the diagnosis and treatment of sterility is a matter of extreme clinical importance, which demands the keenest acumen and scientific investigation before advising haphazard operations.

Therefore, in the future, let us hope, we may hear less frequently, from a disappointed husband or wife, that well-known lament:—

' Myself when young did eagerly frequent
 Doctor and Saint, and heard great argument
 About it and about; but evermore
 Came out by the same door as in I went.'

POST-MENOPAUSAL UTERINE HÆMORRHAGE

My first real interest in post-menopausal bleeding began after a visit to Nepal in 1924. I was summoned to see a woman aged 46, who had been bleeding excessively after a period of ten months amenorrhœa. The clinical diagnosis was that of fibroids, but when I saw the patient the local condition did not fit in with this and I was inclined to think that a malignant ovarian tumour had invaded the pelvic peritoneum. At operation, a tumour of the left ovary was removed, but it was impossible to deal with the right ovary, as it was involving the whole lateral wall of the pelvis.

Healing was uneventful and the patient was then treated by deep X-rays. Six years later I was requested to be present while Sir Frank Connor removed the gall-bladder, so that I might examine the pelvis thoroughly through the abdominal incision. This I did, but there was no sign or feeling of any growth whatever in the pelvis. Multiple sections were made of the ovary (which I had removed) in India, England and America, and the general consensus was that it was malignant, but I am inclined to think now that it was an innocent granulosa-celled tumour of the ovary.

Since then I have kept a methodical note of all cases of post-menopausal bleeding that have passed through my hands, both here and in Calcutta, dividing them, from a clinical point of view, into those that were due to visible or invisible causes. The visible speak for themselves and are shown in Table I as follows:—

TABLE I.—VISIBLE CAUSES OF POST-MENOPAUSAL BLEEDING

Urethral caruncle (simple)	...	..	..	7
Urethral carcinoma	...	...	..	4
Vulval cancer	...	...	...	10
Decubital ulceration with prolapse	...	...	..	30
Traumatic ulceration due to pessaries, etc.	...	...	...	18
Granuloma pudendum	...	..	..	8
Tubercular ulceration of the vagina	...	...	...	2
Syphilomata and/or elephantiasis	...	..	..	5
Vaginal carcinoma	...	...	...	5
Vaginal polyposis	...	...	...	1
Polypi of the cervix (simple)	...	...	...	23
Inflammatory granulomata of the cervix	..	...	...	1
Cancer of the cervix (primary)	..	...	...	23
" " " " (after subtotal hysterectomy)	...	...	...	2
Tuberculous ulceration of the cervix	...	...	...	1
				140

One feature of this list which may excite comment is the comparative paucity of cases of cancer of the cervix. The reason for this seeming anomaly is that among the indigenous people of the tropics, maturity and child-bearing are almost synchronous events in the hospital class of patient. Indeed, among such people—since, from a religious and ethnic point of view, multiparity is the rule rather than the exception—I would go so far as to say that post-menopausal cancer of the cervix is very rare. To check this statement, in 1930—with the help of my registrar—I went through the out-patients and in-patients' list for five years and found that out of 158 cases of cervical cancer, only 26 were in an operable stage when seen and only 15 had passed the change of life; of these, 9 were Europeans.

I have taken the menopause as a standard to mean the period of six full months after the cessation of normal catamenia.

Amongst pure Europeans, whether immigrant or domiciled, post-menopausal cancer of the cervix is not commonly seen, the reason in the former being that the wives of Europeans return to England with their husbands at about the age of 50, whereas in the case of the latter, habits of greater cleanliness as regards the genital tract and body are more universally practised in the East than they are in the West.

TABLE II.—INVISIBLE CAUSES OF POST-MENOPAUSAL BLEEDING

Carcinoma of the corpus uteri	...	...	...	21
Sarcoma uteri	...	...	...	7
Fibromyomata and submucous fibroids	...	...	...	25
Polypi	...	...	...	37
Senile metropathia	...	...	...	7
Metropathia hæmorrhagica	...	...	...	17
Ovarian tumours (benign)	...	...	...	6
" " (malignant and primary)	...	...	...	31
" " (malignant and secondary)	...	...	...	2
Arteriosclerosis (hyperpiesis)	2
Granulosa tumours	5
Tuberculosis (miliary) of uterus and adnexa	1

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This table is, to my mind, by far the more interesting of the two, in that it comprises not only cases in which an obvious tumour was palpable but also those in which doubt arose as to the probable cause and site of the bleeding, since in many of them nothing abnormal was palpable. In some the mucous membrane was grossly thickened and of the typical 'Swiss cheese' pattern on section and, as expected, one could palpate the typical cystic enlargement of the ovary so well described by Wilfred Shaw and others, but in other cases one failed completely to do so.

In some the mucous membrane was perfectly smooth and atrophic, nothing coming away with the curette, and the uterus being small and thin. In others, perhaps many years after the menopause, one has suddenly found a hyperplastic mucous membrane accompanied by one small single polypus at the fundus, no larger than a pea.

Why do these patients develop symptoms of bleeding or conditions of inexplicable hypertrophy of the mucous membrane, perhaps so long as from ten to fifteen years after the change of life?

To my mind, since it has been recently demonstrated that the urine of 60% of women after the menopause contains prolan, the explanation of such bleeding must be sought in the anterior pituitary body, for how otherwise can we account for this Rip-Van-Winkle-like awakening of ovarian function?

Jeffcoate and Fluhman have suggested that the hypertrophy of the anterior pituitary, found at autopsy after the climacteric, is a compensatory readjustment of balance, following the gradual decrease of ovarian activity, the purpose of this revival of secretion being to stimulate the activity of the failing ovary. In favour of this view is the experiment of Zondek, in which he stimulated and obtained follicular response in the ovaries of

female rats and mice by transplanting into them hypophyseal grafts.

The problem is one of intense interest, and will not be solved until the uterus and ovaries of every case of post-menopausal bleeding without palpable cause can be placed, immediately after operation, in the hands of the biochemist for analysis and animal experimentation, because at present we are in the dark as to whether this positive prolan urine reaction is due to inability of the ovary to utilize it or to a lowered renal threshold for its excretion.

Moreover, is it not possible that gynæcologists can or could advance the work of the biochemist by trying the effect of experimental transplantation into women and animals of grafts taken from the ovaries or endometrium of such a case?

In the table are seven cases of what I have called 'senile metropathia' in opposition to the more general term 'senile endometritis'. My reason is that in none of them was there the least macroscopic or microscopic evidence of any inflammatory condition in the uterus, nor could I detect any pathological state of the ovaries. I have here a specimen, removed recently by vaginal hysterectomy on account of bleeding, from a patient aged 56.

How is it possible to explain the undoubted fact that an organ like the uterus can, after a long, latent period, suddenly give rise to symptoms of bleeding without any ulcerative lesion of its mucosa? What sensitizes the mucous membrane of this uterus? What starts the clock of ovarian function re-ticking? Surely it must be the anterior pituitary.

Passing now to the subject of pelvic neoplasms, only a small proportion of those that are innocent cause bleeding, even though they are twisted or accompanied by inflammation. In the personal record of 547 cases of ovarian tumours which I published in 1931, 63 were in-patients past the menopause; and four of these with innocent growths, and 26 with malignant growths had symptoms of uterine hæmorrhage. Since then I have seen eight more malignant and two more innocent ovarian tumours giving rise to this symptom. One of these was secondary to carcinoma of the large intestine, probably by way of retrograde lymphatic permeation.

My large experience of ovarian tumours confirms me in the belief that, in any case of post-menopausal bleeding where there is the slightest enlargement of the ovary or even resistance in either cul, laparotomy is called for, even though the bleeding is slight and temporary, since a large percentage of these cases are malignant, or, if not actually malignant, belong to the type of folliculomata.

* To what is the bleeding due? Why are 75% of malignant tumours of the ovary bilateral? Why do so many of these patients suffer from primary sterility? The explanation must lie outside the pelvis, its anatomy and its blood and lymph supply. Zondek, Blair-Bell and Susman have shown that malignant tumours and folliculomata of the ovary in some 18% of cases after the change of life give rise to a positive prolan reaction, and that removal of the neoplasm causes this reaction to cease. Is it possible that an ovarian tumour in such a woman may take on the function of the original tissue, just as after thyroidectomy for cancer, metastatic tumours function like the original thyroid? The solution lies in the words of Harvey: 'Study and seek out the secrets of nature by way of experiment'. This we can only do in co-operation with the biochemist, for at present we do not know whether the growth stimulates the hypophysis to increased activity, or whether the growth actually manufactures the hormone; or, still further, whether the increased activity of the pituitary is the cause of the malignancy and bilateral tumour formation. This aspect of malignancy, even though only confined to the genital tract, calls urgently for team work in every big hospital, between the biochemist in his animal laboratory and the surgeon in his ward and theatre, since Table II demonstrates that the percentage of malignant causes of invisible post-menopausal bleeding in an experience of ten years was 39.6%, whereas the incidence of malignancy among the visible causes was 31.4%, *i.e.* out of 304 visible and invisible cases of post-climacteric hæmorrhage, the total incidence of malignancy works out at 35.8%, which is considerably less than that recorded by Mahmy from the Edinburgh School. Some explanation of this discrepancy is due to the fact that post-menopausal cancer of the cervix is rare in the East, for the reasons that I have given, although ante-menopausal cancer of the cervix is exceedingly common.

Of the five granulosa tumours, four were innocent; one only was definitely malignant on section. (the patient died four months later from a metastases in the lung).

TREATMENT.—It is not my intention to deal individually with the laparotomy treatment of these patients, but I want to put in a strong plea for the vaginal-surgical—as against the radium—method of treatment in certain cases. In saying this, I feel somewhat like Daniel amongst the lions, for I fully appreciate that there are many here who, for cases of metropathia hæmorrhagica and the like, prefer the application of radium after curettage.

For my own part, in all cases of metropathia, and even where polypi and submucous fibroids occupy a post-menopausal uterus which is no bigger than a nine-weeks' pregnancy, I prefer

to carry out vaginal hysterectomy, which can be done in under forty-five minutes, is almost a bloodless operation, and in 99% of the cases is followed by a painless convalescence with no post-operative disabilities. Moreover, I am not at all sure that it is not, in the long run, a cheaper method of treatment, as the patients are up and away between ten and fifteen days afterwards.

Up to date I have performed 329 vaginal hysterectomies with four deaths only, that is a mortality of 1·2%. In only one case (an early one) was the bladder injured. In none did secondary hæmorrhage occur.

I am aware that this operation is, with many, an unpopular one, but I am quite sure that it is the ideal operation for many of those cases of ante- and post-menopausal benign bleeding which occur in patients whose uteri, small or moderately large, are unaccompanied by adhesions of old, inflammatory, adnexal disease.

Radium, I know, has its advocates, but I consider that its disadvantages overweigh its advantages, since in some cases it fails to achieve its object, in others it gives rise to a constant discharge, causing pruritus, and in still others it manufactures in the mind of the woman and/or her relatives an obsession of cancerophobia, which many of us here have met and have been unable to counter.

' GYNÆCOLOGICAL REGRETS ' ¹

IMPERFORATE HYMEN: THE DANGER OF HÆMATOMETRA.—In 1911 a pretty Anglo-Indian girl, aged 18, was brought to hospital with what was considered simple hæmatocolpos—maturity is commonly reached at 10 in the tropics. I did the usual crucial incision operation on the following morning; in four days' time she was dead of septic peritonitis. The necropsy demonstrated that she had not only hæmatocolpos, but also hæmatocervix, hæmatometra and hæmatosalpinx. She had been bleeding (and distending) month by month from below upwards into all those structures, and at no period had the pain been unbearable. The fluid contents of such a case after vaginal operation are a perfect medium for the growth of organisms. Scores of such cases have been since recorded, therefore let no one vaginally operate on a case of hæmatocolpos unless he is sure the patient has not got hæmatometra or hæmatosalpinx. If you have any doubt (a rectal examination will help you), open the abdomen, and if hæmatosalpinx exists, tie off the tubes and later slit the vaginal membrane to let the mens-

¹ Post-Graduate Lecture delivered at West London Hospital.

trual fluid out; let it run out slowly without any suprapubic pressure.

MISTAKES IN PERINÆORRHAPHY.—Many years ago I saw a woman who had had a colpo-perinæorrhaphy by a missionary doctor; by chance he had pricked or button-holed the rectum. In three weeks she had a recto-vaginal fistula. She was naturally indignant because it meant another operation. The accident would not have happened if that doctor had known the old advice of Mr. Cuthbert Lockyer: 'Everybody doing a perinæorrhaphy, unless he is experienced, should put into the rectum a half-size Hegar's dilator, so that he can see as well as feel where the rectal wall is.'

The perinæum may be sewn up too tightly. Seven years ago one of my medical friends was nearly sued by a furious husband because he had done a perinæorrhaphy in such a way that coitus was not possible. In America two cases are reported in which, for this reason, a surgeon was shot by an indignant husband.

Another trouble is sloughing of the perinæum, which sometimes will happen even after the most careful suturing. The vascular supply is not very generous, so that if you put sutures in too tightly, or if you do not bring muscle to muscle and fascia to fascia, the perinæum may slough, and so the patient will not be benefited after two or three weeks in bed.

X-RAY BURN.—Ten months ago I was summoned as a witness in a case in which a very experienced radiologist was mulcted in heavy damages. I had sent a lady to him to have X-ray treatment for pruritus which had resisted all other treatment. He applied X-rays once only, but possibly as a result of much previous medical treatment to the part, or because of an idiosyncrasy to the rays, she developed a burn many months later which had to be excised for fear of malignancy, as it would not heal.

And that reminds me that a patient may develop epithelioma subsequent to pruritus which has resisted all treatment. Moreover, I have known cases of pruritus which have passed on to a condition known as kraurosis vulvæ or leucoplakia, a predisposing stage to epithelioma; indeed, I have seen several cases of epithelioma of the perinæum which started as pruritus. If I had appreciated that earlier in my career I should have done a Ball's operation or vulvectomy more often, and treated pruritus as a very significant symptom demanding every care in treatment and prognosis.

FENTON'S OPERATION.—Fenton's operation was devised for the woman with hypoplasia of the introitus which prevents

coitus. You cut down the perinæum half-way to the anus, and then sew up in a transverse direction. Once upon a time such a patient lived four miles from where I did; about the seventh day she awoke in the middle of the night bleeding severely from the hymeneal artery. I was sent for, and when I arrived she had air-hunger and a pulse of 140; the hæmorrhage was enormous. That artery may bleed on the night of matrimony, and it sometimes bleeds after Fenton's operation, unless you warn the patient that at the first sign of real bleeding all that is necessary for her to do is to take a one-ounce bottle which is round, put it into the vagina and press it down on to the bleeding point. There is no need to operate or to stitch, or to put on artery forceps. The patient will then be well in a few hours. I did that in the case of the above patient.

INJURY OF THE RECTUM IN ADMINISTRATION OF AN ENEMA.—I have known a woman die of collapse subsequent to administration of an enema. She just sank away, probably because of some vasomotor upset, possibly via the vagus. On the other hand, I have seen a patient who, as the result of careless nursing, developed tremendous pararectal cellulitis and subsequent proctitis, the nurse having pushed the syringe nozzle through the mucous membrane of the rectum. Mr. Zachary Cope¹ has described two cases of septic cellulitis developing after an enema nozzle had been driven through the rectal mucous membrane, and Mr. H. H. Rayner² previously described three cases. Therefore make sure that a nurse giving an enema uses one with a rubber nozzle, not a vulcanite or, as was formerly employed, a bone one.

OPERATION ON BARTHOLIN'S GLAND.—I know a patient who developed an enormous hæmatoma on one side of the vulva in a well-known hospital, because the surgeon, in removing a cyst of Bartholin's gland, forgot the deep pudic vessels at the bottom of the gland. If you do not suture or underpin those vessels, the patient may develop, later in the day, an enormous hæmatoma vulvæ, which, if it becomes septic, may cause death. The patient mentioned died six weeks later of sepsis, which spread up over the groin.

INGUINAL GRANULOMA MISTAKEN FOR SYPHILIS.—In out-patient departments I have seen doctors who ought to have known better run away when they have seen a case of granuloma pudendum, and say 'Lock Hospital' or 'V.D. Department'. The ulcer looks very like chancroid; it spreads from the groin and may go right down to the perinæum. Granuloma pudendum is not an uncommon disease, even in England.

¹ Lancet, 1938, ii, p. 884.

² Clinical Journal, 1932, p. 208.

Six weeks ago I was asked to see a soldier's wife suffering from inguinal granuloma, who had been sent home to England for antisyphilitic treatment. Six injections of tartar emetic or urea stibamine clears up the condition.

SYPHILIS MISTAKEN FOR ELEPHANTIASIS.—One of the finest surgeons I have known operated on a patient for what he thought was ordinary elephantiasis, due to the *Filaria Bancrofti*. He pricked his finger, and ten days later he had a chancre, and in six months he had lost the roof of his palate. Elephantiasis of the vulva may be tubercular, it may be syphilitic, it may be streptococcal. In America they do not call these cases elephantiasis; they apply the term 'syphiloma'. This, in the vulva of the negress, is very common there, and it looks exactly like the elephantiasis which you may see in the East. If you operate on a case of elephantiasis, take care of your fingers. It is least likely to be filarial.

THE EXAMINATION OF VAGINAL DISCHARGES.—I regret that I did not know earlier of the hanging-drop method of examination of vaginal discharges. If I had, I certainly should not have missed trichomonas, which is probably the commonest cause of the vaginal discharges which worry the general practitioner. It has recently been discovered that these frothy, green discharges which occur in women and will not clear up under ordinary treatment are not due to staphylococcus or streptococcus or gonococcus, but to *Trichomonas vaginalis*, which is a flagellate. The treatment can be summarized as (1) cleanliness; (2) a picric acid 1 per cent. suppository put into the vagina overnight; and (3) one teaspoonful to the pint of water, of lactic acid as a douche. Under that treatment the patient will recover in ten days. In case of recurrence use the picric acid cone again, taking care to put the blunt end in foremost, otherwise the contractile muscles will expel it. If the sharp end is put in first, it will soon come out again. I must have treated hundreds of women with this condition uselessly before I knew that. But do not forget that many women have a decided idiosyncrasy as regards drugs, whether as douches or as preparations put into the vagina.

IDIOSYNCRASY TO BONNEY'S BLUE SOLUTION.—Once I did a hysterectomy on the wife of a banker for fibroids. Following my usual routine, I loosely plugged the vagina overnight—I was operating at the usual hour in the East, 8 o'clock—with gauze soaked in Bonney's blue solution. The operation was a complete success, but next day the patient complained of a burning in the vagina. Two days later it was difficult to keep her in bed, and six days later practically the whole of the vaginal mucous wall sloughed out. It was six weeks before she could leave the nursing home. She had an idiosyncrasy

for Bonney's blue. Her husband refused to pay me; in fact he wanted me to pay part of the nursing costs.

From the contraceptive point of view I have heard of another idiosyncrasy, in consequence of which a woman nearly lost all her teeth and most of her hair. She had been told to put a blue tabloid into the douche liquid, a prescription containing mercury perchloride. She developed mercurial poisoning, in the same way that women occasionally develop carbolic acid poisoning.

PRURITUS FROM LUMINAL.—Certain women develop pruritus, and you cannot cure them because they have an idiosyncrasy to luminal and other barbiturates, which they may take for purposes of sleep. Seven per cent. of women develop a 'bathing-drawers' rash or pruritus from this cause. Some women habitually take these drugs to make them sleep, especially during menstruation.

THE USELESSNESS OF PAINTING THE CERVIX FOR EROSION.—Painting the cervix for erosion is a common practice, but there is no worse tinkering from a gynæcological point of view. It is almost malpraxis to paint a cervix with picric acid or other caustics. The proper treatment is by means of the electro-cautery or a modified Sturmdorf operation. This apparatus costs very little, and it cures. But no patient was ever cured by iodine, picric acid, carbolic or any such preparations.

MALIGNANT DISEASE MISTAKEN FOR CERVICAL POLYPUS.—One of my friends married a lady who was a medical graduate of London University. Eighteen months after marriage this lady, who was not practising, went to another doctor and said she had got a polyp; would she remove it? She removed it, and threw it into the waste material bucket. Three months later there was another polyp there, and three or four smaller ones at the mouth of the cervix. In six months' time she had a metastasis in the cervical spine, and in eight months from the first operation she was dead.

The lesson of that case is that after removal of polypi from the cervix you should always have a section of the growth made by an expert pathologist, as it may be malignant. This patient's was a sarcoma botryoides. She herself never thought to have a section taken. The growth may be an early cauliflower carcinoma or an endometrioma.

FATAL HÆMORRHAGE AFTER TRACHELORRHAPHY.—Trachelorrhaphy is an easy operation. Once I lost a patient on whom I had done this operation. When the house-surgeon went round in the evening it was noticed that the

patient was restless, and so morphia was ordered for her. There was very little external bleeding. The nurse never noticed in the night that the pulse-rate was rising, and before dawn she was dead. The necropsy showed a hæmorrhage extending from the broad ligament right up to the right kidney, an enormous hæmatoma; she had died of a simple operation. Why? Because I used catgut. Never use catgut for this operation. Many cases have been recorded of secondary hæmorrhage after trachelorrhaphy, and in every one catgut was used. My case happened in 1920, and I have never since used anything but silkworm gut, which is absolutely safe for the purpose. I had to dismiss both the house-surgeon and the nurse, because they ought to have detected that the pulse-rate had definitely increased, and that something wrong was happening.

STENOSIS AFTER AMPUTATION OF THE CERVIX.—Amputation of the cervix is an operation any of you could do, but it is full of traps. I have twice been compelled to do Cæsarian section on women who had had simple amputations done on the cervix by reputable surgeons in England. The patients had one enormous mass of craggy scar-tissue at the top of the vagina, and the uterus was incapable of pulling it open. I operated when both patients had been in labour some hours.

Another case was diagnosed as sloughing fibroids; she had had a previous operation. I put in a sound and struck pus; she had pyometra subsequent to amputation of the cervix.

Once I was asked to see a woman who had been diagnosed as pregnant. A year or more before she had had an amputation of the cervix and now amenorrhœa for two or three months; she was thought to be pregnant. She had a large hæmatometra.

How do you guard against this danger? (1) Dilate up the cervix to at least No. 12 or No. 14 before you do the operation. (2) Do not completely remove the mucous membrane of the cervix; if that membrane is removed up to the internal os, it is certain cervical stenosis will develop, which may necessitate a second serious operation. Stenosis of the cervix, in damming back the discharges of the cervix, was considered by the late Dr. Graves of Boston, to be an important predisposing cause of cancer.

THE USELESSNESS OF ENDOCRINES BY THE MOUTH.—One of the things I regret is money I have put into the coffers of proprietary chemists, in years gone by, by prescribing extracts of the ovary and corpus luteum. It has been proved that all the endocrine extracts on the market given orally are absolutely useless, excepting one, and that is thyroid gland.